

Preface

Now, after about fifteen years, ***SERKET*** is still working! Its distribution is better than before. It exists now in about twenty countries in five continents (Australia, Austria, Belgium, Czech Republic, Denmark, Egypt, France, Germany, Israel, Italy, New Zealand, Russia, South Africa, Switzerland, United Kingdom, United States of America, and partly in: Japan and South Korea). It is in exchange with eleven periodicals in addition to the exchange with publications of different authors. I hope that the scope of distribution and exchange will be widened during the next years.

There are more authors; it is not the single author bulletin now. I hope to receive more contributions from different authors for publication in ***SERKET***.

The future projects are the same as before, i.e. the publication of re-descriptions of species previously recorded from Egypt, descriptions of new species and revisionary works. The ecological works on spiders in agricultural areas of Egypt are now growing. The parts of "Arachnida of Egypt" will be continued too.

Mr. Awad W. Khalil is still photocopying the issues of ***Serket*** in Xerox Company (Cairo). His efforts are greatly appreciated.

Mr. Abd El-Wahab Kazem (Kazem Advertising, Cairo) is the responsible of producing the cover of ***Serket*** since the second volume. He gave the bulletin its shape.

My sincere thanks are to my family, especially to my father, the first reader of ***SERKET*** who always encourages me and supports my work.

The evaluation and critique of the readers and their contributions are still needed and always appreciated.

The Editor

SERKET

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Correspondence concerning subscription, back issues, publication,
etc. should be addressed to the editor:

Postal address: Hisham K. El-Hennawy
41, El-Manteqa El-Rabia St.,
Heliopolis, Cairo 11341, Egypt.

E-mail: el_hennawy@hotmail.com

Webpage: <http://communities.msn.com/serket>

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A checklist of scorpions (Arachnida) in the collection of the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany

František Kovařík
P.O.Box 27, CZ-145 01 Praha 45, Czech Republic

Abstract

A total of 2941 specimens of scorpions deposited in the collection is determined and revised. The collection contains 229 species, 62 genera, and 14 families. It includes types of 26 species and subspecies, of which 13 are valid. *Heterometrus petersi luzonensis* Couzijn, 1981 is synonymized with *Heterometrus (Javanimetrus) cyaneus* (C.L. Koch, 1836). Revision of specimens identified by Roewer makes doubtful the occurrences of *Parabuthus capensis* (Ehrenberg, 1831) in Namibia, *Parabuthus granulatus* (Ehrenberg, 1831) in Kenya, *Tityus androcottoides* (Karsch, 1879) in Venezuela, *Tityus carinatoides* Mello-Leitão, 1945 in Brazil, *Tityus lutzi* Giltay, 1928 in Argentina, *Tityus magnimanus* Pocock, 1897 in Venezuela, *Opisthacanthus asper* (Peters, 1862) in Tanzania, *Heterometrus liurus* (Pocock, 1897) in Sri Lanka, and *Pandinus militaris* Pocock, 1900 in Sudan. Comparison of types leads to the conclusion that *Pandinus militaris* Pocock, 1900 is a junior synonym of *Pandinus cavimanus* (Pocock, 1888). The occurrences of *Compsobuthus matthiesseni* (Birula, 1905) in Syria and *Paruroctonus becki* (Gertsch & Allred, 1965) in Idaho (USA) are recorded for the first time.

History of the collection

The scorpions assembled at the Senckenberg Museum form a collection of worldwide importance. In the 19th century it was worked on by the renowned German arachnologists F. Karsch and K. Kraepelin, and in the 20th century it received types of several species described by F. Werner and incorporated C. F. Roewer's collection. In 1943 Roewer published a checklist of all the specimens (see Discussion). The collection was studied by a number of well known arachnologists who identified specimens, revised certain species, and added more species. Among them were W. Bücherl, O. F. Francke, M. A. González-Sponga, R. Kinzelbach, B. H. Lamoral, W. R. Lourenço, G. Schmidt, and M. Vachon.

Material and methods

Specimen data are given as they appear on the original labels, with the current country name preceding or substituting for the old name, e. g. “Namibia“ instead of “S.W.-Afrika“. Unfortunately, some locality labels are difficult to read, which may have caused a few inaccuracies in their transcription. Certain label data have proven altogether undecipherable.

I revised the Senckenberg Museum collection between May 1996 and March 2000, when I received it in 27 shipments. Specimens were in alcohol. All examined specimens (except for some already well labeled holotypes and paratypes) have received labels in Ariel or Times New Roman font produced on a laser printer. Basic data are also often penciled on the reverse of the label, as permanency of laser print in alcohol cannot be trusted. The labels contain the generic and species name; author and year of the original description; whether I have determined (det.) or revised (rev.) the specimen; and my name plus the year of the examination.

Abbreviations are as follows:

cf.:	confer, conferred	im.:	immature	S:	specimen
dsg.:	designated	juv.:	juvenile	syn.:	synonymized

List of type material in the collection of the Forschungsinstitut und Naturmuseum Senckenberg

Details concerning localities and specimens are given below in the Results.

Buthidae C. L. Koch, 1837

Ananteris columbiana Lourenço, 1991 (holotype, allotype, and paratypes)

Caribetityus elii (Armas & Marcano Fondeur, 1992) (paratypes)

Hottentotta rugiscutis (Pocock, 1897)

= *Hemibuthus kraepelini* Roewer, 1943 (lectotype and paralectotypes) (dsg. and syn. by Kovařík, 1999: 291)

Isometrus (Isometrus) maculatus (De Geer, 1778)

= *Isometrus madagassus* Roewer, 1943 (holotype) (syn. by Lourenço, 1996: 444)

Lychas mucronatus (Fabricius, 1798)

= *Lychas mentawaius* Roewer, 1943 (holotype) (syn. by Kovařík, 1997: 342)

Microtityus paucidentatus Armas & Marcano Fondeur, 1992 (paratypes)

Orthochiroides vachoni Kovařík, 1998 (paratype).

Orthochirus luteipes Roewer, 1943 (lectotype and paralectotype) (dsg. by Kovařík, 1996: 180)

Rhopalurus agamemnon (C. L. Koch, 1840)

= *Rhopalurus iglesiasi* Werner, 1927 (holotype and paratypes) (syn. by Lucas & Bücherl, 1972: 262)

Tityus clathratus C. L. Koch, 1843

= *Tityus fahrenheitzi* Roewer, 1943 (holotype and paratypes) (syn. by Lourenço, 1984: 357)

Tityus costatus (Karsch, 1879)

= *Tityus bresslaui* Werner, 1927 (holotype) (syn. by Mello-Leitão, 1945: 373)

= *Tityus novateutoniae* Roewer, 1943 (holotype) (syn. by Lourenço & Eickstedt, 1988: 8)

Tityus tayrona Lourenço, 1991 (holotype and paratypes)

Diplocentridae Karsch, 1880

Didymocentrus krausi Francke, 1978 (holotype)

Ischnuridae Simon, 1879

Hadogenes tityrus (Simon, 1888)

= *Hadogenes bifossulatus* Roewer, 1943 (holotype) (syn. by Newlands, 1980: 72; Kovařík, 1998: 133)

Hadogenes troglodytes (Peters, 1862)

= *Hadogenes troglodytes letabensis* Werner, 1933 (holotype and paratypes) (syn. by Newlands, 1980: 124; Kovařík, 1998: 133)

Iuridae Thorell, 1876

Iurus dufourei (Brullé, 1832)

= *Chaerilomma dekanum* Roewer, 1943 (holotype) (syn. by Vachon, 1966: 453)

Scorpionidae Latreille, 1802

Heterometrus (Chersonesometrus) fastigosus Couzijn, 1981 (holotype and paratypes)

Heterometrus (Chersonesometrus) granulomanus Couzijn, 1981 (paratype)

Heterometrus (Chersonesometrus) pelekomanus Couzijn, 1981 (holotype and paratypes)

Heterometrus (Heterometrus) liophysa laevifrons Roewer, 1943 (holotype and paratype)

Heterometrus (Heterometrus) longimanus belitungensis Couzijn, 1981 (paratypes)

Heterometrus (Javanimetrus) cyaneus (C. L. Koch, 1836)

= *Heterometrus petersi luzonensis* Couzijn, 1981 (holotype and paratype) **syn. n.**

Opisthophthalmus schultzei Kraepelin, 1908

= *Opisthophthalmus laevicauda* Roewer, 1943 (holotype) (syn. by Lamoral, 1979: 745)

Scorpiopidae Kraepelin, 1905

Scorpiops dastychi Kovařík, 2000 (paratype)

Urodacidae Pocock, 1893

Urodacus novaehollandiae Peters, 1862

= *Urodacus marianus* Roewer, 1943 (holotype) (syn. by L. E. Koch, 1977: 194)

Results

Bothriuridae Simon, 1880

Bothriurus sp.

Argentina, Prov. Mendoza, Cordillere, 1S (damaged), 29.XII.1913, leg. H. Gehrt-Borm.

Bothriurus araguayae Vellard, 1934

Brazil, Rio, Fischerdörrer, Piratininga, Itaipu, u. Itacoatiara, IX.1961-II.1963, 1♀, leg. Bücherl, No. 24484.

Bothriurus bonariensis (C. L. Koch, 1842)

Brazil, Rio Grande do Sul, 1875, 3♂, leg. Finger, No. 5181. **Paraguay**, San Bernardino, 1♂, 27.V.1914, leg. A. Fischer.

Bothriurus burmeisteri Kraepelin, 1894

Argentina, (Patagonien), Santa Cruz, 19♂47♀25juv., leg. Dade, No. 8857.

Bothriurus cf. *vittatus* (Guérin-Méneville, 1838)

Argentina, Bahia Blanca, 1♀, No. 6748/155.

Bothriurus sp.

Argentina, Prov. San Luís, 1♀, 29.XII.1913, leg. H. Gehrt-Borm.

Brachistosternus (Brachistosternus) ehrenbergi (Gervais, 1841)

Peru, 1♂1♀, No. 8058/173; Pacasmayo, 1889, 1♀, leg. M. Bamberger, No. 5185; S. Paita, 19.XI.1950, 1♂, leg. Koepcke, No. 8778; Lurib. Lima, 23.II.1951, 1♀, leg. Koepcke, No. 8781; La Ventanilla b. Lima, 15.III.1951, 1♀, leg. Koepcke, No. 8780; Hda. Villa b. Lima,

- 1.IV.1951, 1♀, leg. Koepcke, No. 8782; Lomas v. Atocongo b. Lima, 200 m, 2.VII.1951, 1♂, leg. Koepcke, No. 8790; La Chira b. Lima, 14.VII.1951, 1♀1juv., leg. Koepcke, No. 8783; Lomas v. Lachay b. Chancay, 25.X.1951, 1♀, leg. Koepcke, No. 8785; Lomas v. Atocongo b. Lima, 28.X.1951, 2♀3juv., leg. Koepcke, No. 8786; Lomas v. Atocongo b. Lima, 150 m, 4.XI.1951, 1juv., leg. Koepcke, No. 8784; Lomas v. Atocongo b. Lima, 400 m, 20.XI.1951, 3♀, leg. Koepcke, No. 8787; b. Arquipa, wesk. Andenseita, 2200 m, 15.II.1953, leg. Koepcke, 1juv., No. 8788, 1♀, No. 8789.
- Brachistosternus (Leptisternus) intermedius* Lönnberg, 1902
Bolivia, Rio Pilcomayo, San Francisco de Villa Montes, 3♀, 1927, leg. F. Berg.
- Brachistosternus (Ministernus) ferrugineus* (Thorell, 1876)
Paraguay, San Bernardino, 1juv., 31.XII.1910, leg. A. Fischer.
- Cercophonius sulcatus* Kraepelin, 1908
Australia, Tingle, 1♂, 11.II.1957, leg. Felten.
- Orobothriurus alticola* (Pocock, 1900)
Chile, Valparaíso, 1♀, 1933, leg. K. Rühle; Hochkordillere bei Lo Valdés, 2000-3000 m, 2♀1juv., 1933, leg. K. Rühle; Valparaíso, 1♂1♀, leg. Wistormayer, No. 6747/154; Santiago, 1♂, leg. Wistormayer, No. 8850/192.
- Orobothriurus cf. alticola* (Pocock, 1900)
 ?, Küsten Kordillere, Raum, Limache and Ocoatal, 3♂5♀2juv..
- Orobothriurus cf. dumayi* (Cekalovic, 1974)
Argentina, Comodore Rivadavia, 1♀, 1933, leg. S. König.
- Orobothriurus* sp.
Argentina, Río Negro, El Sillon, 1♂. ?, Rom, Palatin, 1♂ (damaged), VI.1906, leg. S. G. von Arand.
- Orobothriurus* sp.
Peru, Hda Llaguán (07°40'S, 78°40'W), 2660, 1♂, 14.XII.1952, leg. Koepcke, No. 8777; b. Jauja, 3500 m, 1juv., 3.VIII.1953, leg. Koepcke, No. 8774; bei Campanillaya, 2600 m, 6.VIII.1953, 2♀2im., leg. Koepcke, No. 8775; Lag. Alacocha, b. Junín-see, 4300, 8.VIII.1953, 1♂3im., leg. Koepcke, No. 8776;
- Orobothriurus* sp.
Peru, Chilca u. Mala, s. Lima, 12.II.1951, 1juv., leg. Koepcke, No. 8779.
- Phoniocercus pictus* Pocock, 1893
Chile, Valdivia, 1♀, No. 8056/171.
- Thestylus glasioui* (Bertkau, 1880)
Brazil, Petropolis, 1♀ (damaged); Petropolis, 2♂1♀, No. 5126; Gorduras (Minas Gerais), 4.X.1913, 1♀, leg. E. Bresslau, No. 5127.
- Timogenes elegans* (Mello-Leitão, 1931)
Bolivia, Rio Pilcomayo, San Francisco de Villa Montes, 2♀1juv., 1927, leg. F. Berg.

Buthidae C. L. Koch, 1837

- Ananteris columbiana* Lourenço, 1991
Colombia, Dept. Magdalena, Bahía de Guairaca, Tayrona Park, VI.1985, 1juv. (paratype), No. 37017, 12.VII.1985, 1♀ (paratype), 26.VII.1985, 1♀ (allotype – labeled as *Ananteris ashmolei*) 1juv. (paratype), No. 37015, No. 37010, 6.XI.1985, 1♂ (holotype), No. 37016, leg. H.-G. Müller; Dept. Magdalena, Villa Culebra bei Bonda, XI.-XII.1985, 1♀ (paratype), No. 37018, leg. H.-G. Müller.
- Ananteris cussinii* Borelli, 1910
Venezuela, Maracay, 1934, 4♂13♀, No. 6653/61, rev. Maury (1971) and Vachon (1970-1976 - VA 1369).
- Androctonus amoreuxi* (Audouin, 1825)
Algeria, Djanet, Adjua-Houlleire, 1juv., No. 13023. **Egypt**, Cairo, 3juv., No. 6277/56; Cairo, 1♀, No. 6657/64; Mohila [Maybe: Mehalla], 1827, 2juv., leg. E. Rüppell, No. 30645; 1828, 1♂, leg. E. Rüppell, No. 5262; Cairo, 23.V.1914, 1♀, leg. Bannwarth, No. 5261; 1928, 1♂, leg. E. Rüppell, No. 5212; Djebel Genaifa, 1947, 1♂, leg. Konieczny, No. 5383. **Libya**, 24 km S Bu Ngem, 14.IX.1961, 1juv., leg. Bruer. **Sudan**, Wadi Halfa, 1♀, No. 6659/66. ?, N. Afrika, 2♂, No. 5271; Nubia, 1823, 1♂2♀, leg. E. Rüppell, Nos 5282 and 5305; 1♀ no locality.
- Androctonus australis* (Linnaeus, 1758)
Algeria, bei Oran, 1♂1juv., No. 6658/65. **Egypt**, 3♂3♀4im., leg. E. Rüppell, No. 5309. **Libya**, 1942, 1♂, leg. Stürmer, No. 5385. **Tunisia**, Sfax, 1913, 1♀1juv., leg. Sabich, No. 6656/63; SW Sidi-Ben-Said u Hammamlit-Soliman, 1941, 1♂1juv., leg. Wollenberg, No.

5379. ♀, Sahara, 1♀, leg. Beverförde, No. 5259; Afrika, 1885, 2♂1♀1juv., leg. L. Heyden, No. 5311; 1♂4♀8juv., No. 5310; 7♂9♀1juv., No. 5312; Nubien, 1823, 1♀, leg. E. Rüppell, No. 5273; Golf v. Boruba (?), IV.1957, 1♀, leg. Dr. Kalta; 3♂2♀2juv. no locality; 1♂ no locality, No. 24514.
- Androctonus bicolor* Ehrenberg, 1828
Algeria, Figig-Oase, 1♀, No. 6661/68. **Egypt**, Cairo, 1♂., 1826, leg. E. Rüppell, No. 5283. **Israel**, Haiffa, 2♀, 1880, leg. H. Simon, No. 5245; Haiffa, 1886, 1juv., leg. H. Simon, No. 5270; Jaffa, 17.I.1913, 1♀, leg. Aharoni, No. 5269, Umgebung v. Jerusalem, 1♀, leg. Verechson, No. 13026. **Libya**, 1942, 1♀, leg. Stürmer, No. 5386; 3♂, 1958, leg. Brandt. **Tunisia**, oasa Tozeur, 1♀, leg. F. Celo, No. 13025. ♀, 1899, 1♀, leg. Dönitz, No. 5258.
- Androctonus crassicauda* (Olivier, 1807)
Iran, Ahwaz, 1♂, 1961, leg. Schubert, No. 12109/1. **Israel**, Zoo gestorben, 1♀. **Saudi Arabia**, 150 km ssö El Riyadh, 13.VI.1959, 3♂, leg. Diehl, Nos 34542-3. **Syria**, Homs, 2♂, No. 4980/24; Abou Hourejra a Euphrat, 1962, 1♀, leg. F. Celo, No. 13022; Nahr-al-Habur Area, 35°37'N 40°45'E, Tall Shaih Hamad, 1♂2♀3juv., 21.-24.IX.1988, TSH 1/88; Abu Galál, 25.IX.1988, 1♂1juv., TSH 6/88; Nahr-al-Habur Area, 36°24'N 40°49'E, Tall Budairi, 1♀, 30.IX.1988, TSH 9/88; Steppe ca 11km NO von Tall Shaih Hamad, 12.X.1988, 2♂, TSH 41/88; 5km SE Margáda, 12.X.1988, 1♀, TSH 42/88; Steppe ca 2km SO von Margáda, 12.X.1988, 1♀, TSH 43/88; 4♂1♀.
- Androctonus hoggarensis* (Pallary, 1929)
Algeria, Hoggar-Geb, 1♂, No. 6660/67.
- Androctonus mauretanicus* (Pocock, 1902)
Morocco, Masagan, 1juv., leg. Fritsch & Rein, No. 5268; Rabat, 2juv., No. 6662/69; 1♂1♀2im.2juv., leg. Fritsch, No. 5242.
- Babycurus buettneri* Karsch, 1886
Gabun, Ogowe, 1♀, No. 6695/102.
- Babycurus jacksoni* (Pocock, 1890)
Kenya, O. A. Afrika, Mombasa, 25.XII.1969, 1♀, leg. M. Grasshoff; Watamu Beach, II.1981, 1♂, leg. Kaingulashe. **Namibia**, Windhoek (loc. in error ?), V.1912, 6♂7♀, leg. F. Schmidt, Nos 5293 and 5314. ♀, O. Afrika, 2♀, leg. Knippes.
- Babycurus kirki* (Pocock, 1890)
Togo, Atakpame, 1♀; Kete Kratschi, 2♀, No. 8873/215.
- Babycurus* sp.
Mozambique, Tete, 1juv., IV.1947.
- Buthacus arenicola* (Simon, 1885)
Algeria, Djanet, Adjua-Houlleire, 1♂, No. 13023.
- Buthacus leptochelys* (Ehrenberg, 1829)
1♀ no locality.
- Buthacus tadmorensis tadmorensis* (Simon, 1892)
Syria, Abou Holireira am Euphrat, 4♀, leg. Celo, No. 13029; Nahr-al-Habur Area, 35°37'N 40°45'E, Tall Shaih Hamad, 1♀1im.8juv., 21.-24.IX.1988, TSH 1/88; Abu Galál, 25.IX.1988, 1♂1juv., TSH 6/88; Qalcat Sakkara, 2.X.1988, 2♂ (?), TSH 13/88.
- Buthoscorpio politus* (Pocock, 1899)
India, S. Dekan, Anamalei, 1♀, det. 1932, No. 8869/211.
- Buthus occitanus* (Amoreux, 1789)
Israel, Haifa, 1910, 1♀, leg. O. Boeltger, No. 5228; Haifa, 1913, 1im., leg. Aharoni, No. 5229. **Libya**, Cyrenaica, 117 km W. Tobruk, 28.IV.1957, 1♂, leg. Kaltenbach; 1958, 2♀2juv., leg. Brandt. **Morocco**, Casablanca, 3im., leg. Fritsch, Nos 5222 and 29224; Tilla, Mogador, 1♂1♀, leg. Fritsch & Rein, No. 5227; Ain Diab, 1934, 2♂2♀, leg. Bysch-Mainz, No. 5408. ♀, N. Afrika, 1♀, No. 5272; Hoher Atlas, Marakech v. Tiznit, 18.IV.1968, 2♀, leg. P. Teisig; West Atlas, Argana env., 28.I.1975, 1♀, leg. D. Kock. ♀, 1♂; Sektana, 1♂1juv., No. 5226; NW Afrika, 1881, 2♀, leg. W. Kobelt, No. 5225; 1899, 5♀, leg. W. Dönitz, No. 5239. **USA**, Texas, 1♂, leg. Tips (loc. in error ?).
- Buthus occitanus barcaeus* Birula, 1909
Libya, 2juv., leg. Brandt, Nos 29223 and 29225, det. M. Vachon (1976 - No. 1076).
- Buthus occitanus occitanus* (Amoreux, 1789)
France, Gall, 1♀, leg. Leuckadt, No. 5223. **Portugal**, 1♀, No. 25898. **Spain**, Oropesa, 1♂1♀, No. 6672/79; prov. Castelloni, Alcosobra, Playa Calcala de Chisbert, 1♂, leg. Kluge, No. 25896/1; prov. Tarragona, Flix, 1♂3♀1im41juv. before 1st ecdysis, leg. F. Haas, No. 5237; south, 1887, 2♀, leg. H. Simon, No. 5241; Barcelona, 1914, 1juv., leg. A. Fahr, No. 5231;

- prov. Tarragona, 1915, 7♂20♀21juv., leg. F. Haas, No. 5307; Sierra de la Picos b. Mora, III.1918, 1♀, leg. F. Haas, No. 52238; Puente de Montana, III.1918, 1♀1juv., leg. Malec, No. 25895/2; prov. Gerona, Sa Riera (Bagur), 29.III.1964, 1im.1juv., No. 25897/2.
- Buthus occitanus tunetanus* (Herbst, 1800)
Tunisia, Stadt, 2♂1♀, No. 6673/80; 1906, 1♂, leg. Pfaff, No. 2921; 1906, 1♂, No. 5390.
- Caribetityus elii* (Armas & Marcato Fondur, 1992)
Dominican Republic, Prov. La Vega, Jarabacoa, La Golondrina, 1400 m, 2♀ (paratypes), leg. E. Martínez, No. 38697.
- Centruroides exilicauda* (Wood, 1863)
USA, Arizona, Morenci, 1906, 1♀ (im.), leg. A. Lotichius, No. 5153.
- Centruroides exsul* (Meise, 1933)
Galapagos, Abingdon, 15.VIII.1957, 1♀, leg. Eibl, No. 25940; Island Indefatigable, Akademiebucht, 17.VII.1957, 1♂2♀ (im.), leg. Eibl, No. 25938; Island Indefatigable, 1966, 2♀2juv., leg. Eibl-Eibesfeldi, Nos 25937 and 25939.
- Centruroides flavopictus* (Pocock, 1898)
Mexico, Chiapas, Prusia, 1933, 1♀, leg. Wagner, No. 5371; Chiapas, Gadow, 1938, 1♀, leg. Wagner, No. 5372; Stadt. Umgebung, 1♂, No. 5714/29.
- Centruroides gracilis* (Latreille, 1804)
Guatemala, 1897, 1♂; 1897, 4♀1im., leg. Fleischmann, No. 5180; Ousaltémango, 1♀, leg. Walte, No. 8062/177. **Mexico**, Mazatlan, 1♂1♀, No. 678/7; 1♀, Mus. Hamburg, No. 5155; Veracruz, 1♂, No. 5982/34. ?, (in Frankfurt leben eingeschleppt), 1♀, 1925.
- Centruroides limbatus* (Pocock, 1898)
Guatemala, Quezal tenango, 1♀ (after 4th ecdysis), leg. Walte, No. 6746/153.
- Centruroides cf. limbatus* (Pocock, 1898)
 ?, mit Bananen 1931 in Frankfurt, 1juv.
- Centruroides limpidus* (Karsch, 1879)
Mexico, 2juv., leg. H. Wagner.
- Centruroides margaritatus* (Gervais, 1841)
Colombia, 1885, 1♀, leg. Lehmann, No. 5154; Macarena (Zanza), 450-500 m, 1♀, II.1956; La Guayaquina, Wald, 240 m, 2juv., 31.VII.1956, leg. H. Sturm; Sta Marta, IX.1974, 3♀, leg. Grasshoff; Dept. Magdalena, Punta de Betin, Santa Marta, I.-III.1986, 1♂2♀3juv., leg. H.-G. Müller. **Costa Rica**, San José, 1♀, No. 8063/178; San José, 1892, 1♀, leg. C. Fleischmann, No. 5373; San Miguel, 1♀, 6.VI.1937, Prinz Sigismund. **Cuba**, 3♂1♀1juv., No. 5718/33; 1♀, No. 6652/60. **Guatemala**, 1885, 1juv., leg. Lehmann, No. 5156; 1905, 1♀, leg. Fleischmann, No. 5163. **Honduras**, Nacaomo, 1914, 1♂1♀, leg. Flüge, No. 5387; 1♀, No. 5711/26; mit Bananen in Frankfurt, 1♂, 25.I.1934. **Jamaica**, 1♂1♀, No. 6745/152. **Mexico**, Mazatlán, 1871, 1♂, No. 5164; Mazatlán, 1♂4♀1juv., No. 5717/32; 1♀, No. 5187. **Salvador**, 2♀1juv., No. 6262/41; Aquachapan, 18.VII.1950, 1♀(im.), leg. Mertens, No. 8721; Sisimico, 11.X.1950, 1♀, leg. Mertens, No. 8733; Justitut, 1951, 9♂21♀24juv., leg. A. Zilch, No. 8730; Los Cobanos, 10.V.1951, 1♂, leg. A. Zilch, No. 8725; Laguna de Zapotitan, 450 m, 29.VI.1951, 1juv., leg. Zilch, No. 8728; Mdg. d. Rio Chilana, 6.VII.1951, 2juv., leg. A. Zilch, No. 8729; km 48 to Sousanete, 600 m, 10.VII.1951, 3juv., leg. A. Zilch, No. 8723, 4.VIII.1951, 1juv., leg. A. Zilch, No. 8724. Loas Cabanos, 5♂1♀, 10.VIII.1951, leg. A. Zilch, No. 8726; Waldch. ub. d. Strand Felsen, Acajutla, 10.VIII.1951, 1♂1♀(im.), leg. A. Zilch, No. 8727; road La Union to Pasaquina, 19.VIII.1951, 1♀2im., leg. A. Zilch, No. 8738; O-Seite d. Cerro de Gua-Zapa, 800 m, 21.VIII.1951, 1♀, leg. A. Zilch, No. 8732; Hda. Los Planes, 1800 m, 25.VIII.1951, 1juv., leg. A. Zilch, No. 8722; km 155 to La Union, 12.IX.1951, 3♂2♀1juv., leg. A. Zilch, No. 8737; San Salvador, Justitut, 1952, 4♂11♀11juv., leg. O. Schuster & H. Felten, No. 8731; Santa Ana, 4.XI.1952, 1♂1♀, leg. H. Felten, Nos 8739 and 8740; San Andres, 16.IX.1953, 1♀1im., leg. H. Falten, No. 8742; Opico, 390 m, 20.XI.1953, 1♂1♀1juv., leg. H. Falten, No. 8741; 1♀, 12.XI.1954, 1♀1juv. after 4th ecdysis, 1954, 1♀, 5.IX.1955, 1♀, 20.IX.1955, 1♀, 24.X.1955, 1juv. after 3rd ecdysis, 1955, leg. Schustel ; O-Kegal d. San Vincente, Finca El Caruen, 1300 m, 10.X.1957, 1♀5juv., leg. A. Zilch, No. 8734, 1juv., No. 8736, 30.VII.1952, 3juv., leg. O. Schuster, No. 8735.
- Centruroides cf. margaritatus* (Gervais, 1841)
Honduras, 1♂ (import).
- Centruroides nitidus* (Thorell, 1876)
Dominican Republic, Santa Ana near Ciudad Trujillo, 22.2.1939, 1♀, leg. Martens, No. 5370.

- Centruroides* cf. *ochraceus* (Pocock, 1898)
Mexico, 3♀, No. 5179; 1866, 1♀, No. 5152.
- Centruroides testaceus* (De Geer, 1778)
Costa Rica, Hamburg Farm, 1♂1♀, No. 8064/179. **Lesser Antilles**, Bonaire Island, 1♂1♀, No. 679/8.
- Centruroides* cf. *thorellii* (Kraepelin, 1891)
Honduras, Dpto. de Ocotepeque, Guisayok, 1900 m, 14°27'58"N, 89°04'53"W, 1♀, 4.X.1996, leg. G. Köhler.
- Centruroides vittatus* (Say, 1821)
USA, Cincinnati, 1894, 1♂1♀(im.), leg. Zipperler, No. 5151. ?, 1♂1♀, No. 29200.
- Centruroides* sp.
Salvador, 1juv. after 1st ecdysis, VI. 1955.
- Compsobuthus acutecarinatus* (Simon, 1882)
Saudi Arabia, 150 km ssö El Riyadh, 13.VI.1959, 1♂ (im.), leg. Diehl, No. 29218. **Sudan**, Sennar, 1♀, No. 8860/202.
- Compsobuthus brevipennis* (Werner, 1936)
Yemen, 2♀, No. 6663/72.
- Compsobuthus matthiesseni* (Birula, 1905)
Syria, Nahr-al-Habur Area, 35°37'N 40°45'E, Tall Shaih Hamad, 2♂5♀6juv., 21.-24.IX.1988, TSH 1/88; Qalcat Sakkara, 1♀, 2.X.1988, TSH 13/88; Gabal Abd-al-Aziz, 1♀1juv., 2.X.1988, TSH 15/88; 5km SE Margáda, 1♀, 12.X.1988, TSH 42/88.
- cf. *Compsobuthus matthiesseni* (Birula, 1905)
Syria, Tall Gunaidiya, 1juv., 5.X.1988, TSH 20/88.
- Compsobuthus werneri* (Birula, 1908)
Libya, 1♀ (im.), leg. Brandt, No. 29220. **Sudan**, Dafur Prov., El Fashes, XI.1961, 1♀, leg. H. Schwitulla. **Syria**, Nahr-al-Habur Area, 35°37'N, 40°45'E, Tall Shaih Hamad, 3♀(?im.), 21.-24.IX.1988, TSH 1/88.
- Grosphus madagascariensis* (Gervais, 1843)
Madagascar, 1885, 5♀, leg. A. Stümpf, Nos 5176 and 5178; 2♀, No. 5177; Sikora, 1♀, No. 6685/92; Station forestiere de Perinet, Cote d'est, 860 m, Eu montant avant Moramanga, 1♂2♀1juv., 1960, leg. Koch; 1♂.
- Hottentotta alticola* (Pocock, 1895)
Afghanistan, Kabul, 30.IV.1961, (18), 1♂.
- Hottentotta conspersa* (Thorell, 1876)
Namibia, 1938, 2♀1im., leg. G. Boss, No. 5393; Farm Okatji Komu, 2♀, 27.X.1952; 1juv., 1956, leg. F. Gardes.
- Hottentotta franzwerneri franzwerneri* (Birula, 1914)
Algeria, Beni Ormi F de Figuigi, VIII.1910, 1im., leg. F. Werner, No. 5128.
- Hottentotta franzwerneri gentili* (Pallary, 1924)
Algeria, Oran, 1♀, No. 6668/75. **Morocco**, Anti Atlas, Anezi, 1♀im., 18.IV.1968, leg. P. Teisig.
- Hottentotta hottentotta* (Fabricius, 1787)
Burkina Faso (H. Volta), Garango, 11°48' N, 0°33' W, 17.X.1966, 1♂(?), leg. Lamontellorie. **Cameroon**, 4.X.1911, 1♀, leg. Schubotz, No. 5248; Duala, 16.XII.1913, 1♀, leg. A. Haas, No. 5247; Edea, 1♀, No. 8863/205. **Cape Verde Is.**, Ribeira da Praia, 1993, 3♀, leg. Santos, No. 38561. **Congo**, Frz. Kongo, Kobo, 15.III.1911, 1juv., leg. Schubotz, No. 5249; Fort Archambault, 1911, 1juv., leg. Schubotz, No. 5250; Fort Crampel, 1911, 2juv., leg. Schubotz, No. 5232. **Guinea**, Franz. Guinea, 1♀, No. 6666/73. **Guinea-Bissau** (Portug. Guinea), 1♀1juv., No. 8862/204. **Togo**, 2♀, leg. Bayer, No. 37466.
- Hottentotta judaica* (Simon, 1872)
Israel, Tel-Aviv, 2♀, No. 6663/70; 1839, 1♂1♀, leg. Rosenbach, No. 5244; Jaffa, 1885, 1♂1♀(im.), leg. H. Simon, No. 5255; Haifa, 1886, 1♂3♀, leg. H. Simon, No. 5243.
- Hottentotta minax* (L. Koch, 1875)
Egypt, 1♂, No. 5246. ? **Kenya** (D. O. Afrika), Tabora, 1913, 5♂5♀1juv., leg. Schablitzi, No. 5220. **Sudan**, Khartoum, 1♂2♀, leg. F. Celo, No. 13028/4; Sennar, 1♀, No. 6667/74.
- Hottentotta pachyura* (Pocock, 1897)
India, Dekan, Nilgiris, 2♀, No. 8851/193.
- Hottentotta rugiscutis* (Pocock, 1897)
India, Dekan, Nilgiris, 1♀ (lectotype of *Hemibuthus kraepelini*) 2♂ (paralectotypes Nos 1-2 of *Hemibuthus kraepelini*) No. 8880/222, 1♂1juv., No. 1084/15.

Hottentotta tamula (Fabricius, 1798)

India, Dekan, Nilgiris, 1 im., No. 8851/193; Dekan, Bombay, 6♂18♀17juv., No. 327/1; Lanooli, 1♂3♀, 10.XII.1911, leg. Löw-Beer, Nos 5251 and 5260; Dekan, Anamalei, 1juv., No. 8852/194.

Hottentotta trilineata (Peters, 1862)

Egypt, 1♀, No. 5246. **Kenya**, O. A. Afrika, Mombasa, 1♀, 25.XII.1969, leg. M. Grasshoff; bei Voi, 1♀, XI.1978, leg. M. Grasshoff. **Mozambique**, Tete, 1♂3♀4juv., IV.1947. **Tanzania**, O. Afrika, Tanga, 1♀, No. 6674/81. ? **Tanzania**, O. Afrika, Iraku-Landschaft, Kohl-Larsen, 1939, 1♂1♀, No. 5388; O. Afrika, Matelebach, Kohl-Larsen, 2♀, No. 5389; D. O. Afrika, 2♂, leg. F. Kinkelin, No. 5219. **R. South Africa**, Transvaal, Southpansberg env., Steinen, XI.1970, 1♂1♀, leg. Lamoral, No. 29296.

Isometrus (Isometrus) maculatus (De Geer, 1778)

Algeria, Stadt, 1♀, No. 6697/104. **Australia**, Caivus, 1♂, leg. Felten. **Brazil**, Amazonas, Manacapuru, 4♂3♀A, VIII.1924, leg. W. Ehrhardt; Amazonas, Manacapuru, Sdimoes, 3♂6♀1juv., VII.1924, leg. W. Erhardt; Olinda (Recifo), St. Pernambuco, 2♀, 24.V.1930; Tiriyo, Maloca am, ob. Rio Parú de Oeste, 1♀, 24.-30.I.1961, leg. Sattler. **Congo DR**, Belg. Kongo, zw. Mutsatscha Dilolo, 1931, 1♀, leg. F. Haas. **India**, Dekan, Anamalei, 1♂1♀2juv., No. 1086/17. **Indonesia**, Sumatra, Deli, 1♀, leg. Heyden, No. 5169; Sumatra, Atjeh (Hügelani Boeloch Blang-Asa über lho Seumawa), 1♂, III.192?, leg. Rookmarker. **Madagascar**, Tananarive, 1♂ (holotype of *Isometrus madagassus*), No. 8879/221; Nossibé, 1898, 2♂4♀, leg. Ebenar, No. 5206. **Surinam**, 1♂, Cardua. **Sri Lanka**, Estate Belitardi, 1914, 2♀, leg. Mastbaum, No. 5167. **Tanzania**, Dar-es-Salaam, 1♂, No. 8868/210. **USA**, Hawaii, Honolulu, 2♂, No. 4942/23. **Venezuela**, San Estaban, Puerto Cabello, 1♀, 19.X.1948, leg. Schöffner; Rancho la Grande, 1♀, II.1955, leg. R. Mertens. ?, Au Bord der "Marie", 1908, 1juv., leg. H. Merton, No. 5166; 1♂2♀, No. 5168; Aroe, Dobo, Wammer, 22.III.1908, 2♀1 im., leg. H. Merton, No. 5165; Elat, Gross-Key, IV.1908, 1♂, leg. H. Merton, No. 5207; Banana, Kongo-Mündung, 1885, 1♂1♀1 im., leg. Hesse, No. 5124; Kawieng, 1juv., 5.IX.1909, leg. E. Wolf (Hanseatische Südsee Expedition 1909). O. Afrika, 1♀, leg. Knippes. Feisuut dem Schiff (Hanseatische Südsee-Expedition), 1♂, 3.10.1909, leg. E. Wolf.

Isometrus (Reddyanus) melanodactylus (L. Koch, 1867)

Australia, Winton, 1♂, No. 6698/105.

Leiurus quinquestriatus (Ehrenberg, 1828)

Egypt, 1826, 2 im., 1828, 1♂, leg. E. Rüppell, Nos 5234 and 5224; 1827 and 1828, 1♂1♀, leg. E. Rüppell; Sinai, 1827, 2 im., leg. E. Rüppell, No. 5230; Tor, 1827, 5♂10♀, leg. E. Rüppell, Nos 5236 and 5308; 1♂1♀1 im.(♀)4juv. no locality; Cairo, 1♂, No. 4981/25; 1♀, leg. Rüppell, No. 30642. **Saudi Arabia**, NW Al Jübail, 27°08'56"N, 49°20'06"E, 1 im., 14.V.1992, leg. D. Kock. **Sudan**, Flussifer bei Omdurman, 1966, 123♂77♀15juv., leg. F. Celo, No. 30639; Khartoum, 1♀, leg. F. Celo, No. 13024. **Syria**, 1882, 1♀, leg. H. Simon, No. 5235; Abou Houreira a. Euphrat, 1962, 1♀1 im., leg. F. Celo, No. 13021. **Yemen**, 1♂1♀1juv., No. 6675/82.

Lychas asper (Pocock, 1891)

Mozambique, Tete, 8♀, IV.1947, No. 10085-6.

Lychas burdoi (Simon, 1882)

Tanzania, O. Afrika, Tanga, 1♀, No. 6690/97. ? **Tanzania** (O. Afrika), 1♀, leg. Knippes.

Lychas marmoreus (C. L. Koch, 1844)

Australia, City Beach, Perth, 1♀, 29.V.1958, leg. J. A. Philipp; 1♀, 1895; 1♀, 23.VI.1911, leg. O. Frank; Adelaide, 1♂, 1952-1953, leg. Hendenstrom, 1♀, 16.III.1957, leg. Falten.

Lychas mucronatus (Fabricius, 1798)

Indonesia, Lombok, Sadjang, 29.IV.1909, 1♂, leg. Elbert, No. 5184; Boeton, 1♀, 1909, Sunda Exped. des Frankf., leg. J. Elbert; Montawein Isl., Sipora, 1♀ (holotype of *Lychas mentaweius* Roewer, 1943), No. 8870/212; Isambawa, Ampong, 1♂, 2.I.1910, leg. J. Elbert, Sunda Exped. des Frankf., rev. M. Vachon 1981, No. VA 2659. **Myanmar**, Zaming, 30 km nördl. Mandalay, 1 im., No. 7983/157; Mt. Popa, 600 m, 1♂, No. 7985/159. **Thailand**, Lat Yao, 25 km W. Nakhon-Sawanr., cca 80 m, VIII.1987, 1♀, leg. Thielen.

Lychas obsti Kraepelin, 1913

Tanzania, Tanga, 1♀, No. 6691/98.

Lychas scutillus C. L. Koch, 1845

Indonesia, Sumatra, Deli, 1♀. No. 6689/99; Sumatra, Baudar Kwala, 1900, 2♂, leg. V. Auer, No. 5171.

- Lychas tricarinatus* (Simon, 1884)
India, Dekan, Anamalei, 1♀, No. 1085/16.
- Mesobuthus eupeus* (C. L. Koch, 1839)
Iran, bei Teheran, 1♀, No. 6669/76; 20 km NE Ahwaz (Khoustan), 20.-30.III.1958, 4♂, leg. H. Frank; Umgeb. v. Ahwaz (Khoustan), 1959, 1♂2♀, leg. H. Frank; Persia, Sultanabad, 1juv., No. 6269/48. ? **Iran**, 1♂. ?, 1♂. **Namibia**, Waterberg, 2♂, No. 8855/197 (loc. in error ?).
- Mesobuthus eupeus eupeus* (C. L. Koch, 1839)
Nagorni Karabakh Autonomous Region, Kaukasus, 1890, 2♂4♀, leg. Valentin, No. 5253, 2♀1im., leg. Valentin, No. 5256; Kaukasus, 1♀, 1890, leg. S. Valentin.
- Mesobuthus eupeus thersites* (C. L. Koch, 1839)
 ?, S. Turkestan, Muschachar, 15.V.1913, 1♀, leg. K. Kuchler, No. 5254.
- Mesobuthus gibbosus* (Brullé, 1832)
Albania, Tafelbene, V.1939, 1♂4♀3im., leg. K. Müller, No. 5381. **Cyprus**, Cypern, Platrea, Trodos Gel, 2♀, leg. Plutruess, No. 6677/84. **Greece**, Chios, 1862, 1♂1♀, leg. S. Pauli, No. 5252; Creta, Akrotiri (Arkalo-Höhle), 1926, 2♂2♀, leg. Roon, No. 685/14, 1juv., leg. Rus, No. 6273/52; Creta, Melidhori, 1♀, No. 8854/196; Morea, Akrokorinth, 1926, 1♀1juv., leg. Rus, No. 6676/83; Samos Island, 1juv., No. 6270/49; Rhodos, Apollo-Tempe, 25.IX.1958, 2♀, leg. R. Martens, No. 10639/2; Preveza, Nikopolis, 1♀, 22.VIII.1964; Nikopolis bei Preveza, 22.VIII.1964, 1♂, No. 25894; Preveza Nikopolis, 22.VIII.1964, 1♀, No. 39236; Peloponnes, Tolon bei Nandja, 26.VI.1985, 1♀, leg. Hohorst, No. 34531. **Turkey**, Karybische Grotte, 26.-27.III.1966, 2♀2juv., leg. Dobat, No. 25893. **Armenia**, Armenia, Marasch (? loc. in error ?), 1906, 2♂5♀, No. 5306.
- Mesobuthus martensii* (Karsch, 1879)
China, Shantung, 1♀, No. 6670/77; Shantung (Kjautschou), 1♂3♀1juv., No. 328/2; Tientsin, 4♀, No. 8861/203; Kreyenberg, 1907, 1♂3♀, leg. Boettger, No. 5240.
- Microtityus (Parvabsonus) paucidentatus* Armas & Marciano Fondeur, 1992
Dominican Republic, Prov. Peraia, Bani, secc. Monteria, La Laguna, 22.V.1988, 2♀ (paratypes), No. 38698.
- Odontobuthus doriae* (Thorell, 1876)
Iran, 1940, 1♀, leg. G. Konieczny, No. 5384. ?, Persien, 1♂, No. 6671/78.
- Odonturus dentatus* Karsch, 1879
Kenya, O. A. Afrika, Mombasa, 1♂, 25.XII.1969, leg. M. Grasshoff. **Tanzania**, O. Afrika, Tanga, 1♂1♀4juv., No. 5983/35, 1♂, No. 6686/93.
- Olivierus caucasicus* (Nordmann, 1840)
Afghanistan, Kabul, (18), 12.IV.1963, 1♀. **Iran**, Shirudi bei Meshed, 1969, 1♀, leg. Kluge and Theissig, No. 34544; Persia, Isphahan, 1♀, No. 5716/31. ? **Uzbekistan**, Turkestan, 1890, 2♀, leg. Retter, No. 5263; Turkestan, Syn Tarja, 2♀, leg. S. Retter, No. 5264; Turkestan, Andishan, 1910, 2♀3juv., leg. J. Kilb, No. 5265; Asjon, Scrobelef, Ferghana, 20.XI.1911, 1im., leg. J. Kilb, No. 5257; Turkestan, Koksavai, Andishan, 9.X.1912, 1♀, No. 5267; S. Turkestan, Safichavan, 31.V.1913, 1♂1im., leg. K. Kuchler, No. 5266.
- Olivierus caucasicus intermedius* (Birula, 1897)
Uzbekistan, Fergana, V.1913, 1im., leg. Skobelev, No. 29221; Fergana, VII.1913, 1im., leg. Kilb, No. 29222.
- Orthochiroides vachoni* Kovařík, 1998
Somalia, Sar Uanle, about 20 km South from Chisimaio, 00°29'48"S, 42°25'30"E, 1♂ (paratype No. 16 [MZUF No. 536]).
- Orthochirus innesi* Simon, 1910
Egypt, Sinai Halbinsel, 9.I.1922, 1♂, leg. A. Andres, No. 5125; 1♂, No. 30644.
- Orthochirus* cf. *innesi* Simon, 1910
 1S, no locality.
- Orthochirus luteipes* Roewer, 1943
India, Dekkan, Anamalei., 1♂ (lectotype) 1♀ (paralectotype No. 1), No. 2124/21. ?, 2♂1♀, No. VA 2182-1-3.
- Parabuthus brevimanus* (Thorell, 1876)
Namibia, Okahandja, 3juv. (1♂2♀), V.1953, leg. Yaerdes.
- Parabuthus granulatus* (Ehrenberg, 1831)
Namibia, Chnosgebirge, 2im., leg. F. Rintelen, No. 5211; Lüderitzbucht, 2♀, No. 6678/85; Waterberg, 1♂3♀, No. 8867/85. ?, 1♀, No. 18156.

- Parabuthus kraepelini* Werner, 1902
Namibia (SW Afrika), Windhoek, 1♂2♀, No. 6278/57, 1♀, No. 6680/87; Berseba, 1♀, No. 6683/90; Berseba, 1♂, No. 6684/91; Sükses near Okahandjo, 1♀, 1952, leg. Martens; Okahandja, 1♀1juv., leg. Gaesdes, 1juv., V.1953, leg. Yarden; Okahandja, X.1955, 1♀, 1957, 3♂3♀1juv., leg. Gaesdes, Nos 9646 and 10532. **R. South Africa** (S Afrika), Cape Town, 1♀(im.), No. 8856/198; Port Elisabeth, 1910, 1♂1♀, leg. Dieges, No. 5214.
- Parabuthus leiosoma* (Ehrenberg, 1828)
 ?, N. Afrika, 1♂, No. 5209.
- Parabuthus pallidus* Pocock, 1895
Tanzania, O. Afrika, Tanga, 1♂, No. 6682/89; D. O. Afrika, Isamba-Plateau, Oberlaof des Bubufi, 1935, 1juv., leg. L. Kohl.
- Parabuthus raudus* (Simon, 1888)
Namibia (SW Afrika), Gobabis, 2juv., No. 676/5; Otavi, 1juv., No. 8866/208.
- Parabuthus stridulus* Hewitt, 1914
Namibia (SW Afrika), Lüderitzbucht, 1♀1juv., No. 5985/37, 1♂1♀, No. 6679/86.
- Parabuthus transvaalicus* Purcell, 1899
R. South Africa, O. Transvaal, Letaba-Camp, 1931, 1♀, leg. F. Haas, No. 5221.
- Parabuthus villosus* (Peters, 1863)
Namibia (SW Afrika) Chnosgebirge, 1♀, leg. F. Rintelen, No. 5203; 1♂, leg. Leonhardt, No. 5233; Windhoek, 2♀, No. 6687/94, 1♂1juv., No. 8848/190; Lüderitzbucht, 2juv., No. 5987/39, 1juv., No. 6740/147, 2juv., No. 8865/207; Berseba, 1♀, No. 6681/88; Waterberg, 2♀, No. 8864/206; Kl. Windhoek, Regent, 1908, 1♂, leg. K. Schliermann, No. 5313; Koelmanshoop, 1913, 1juv., leg. S. Hardt, No. 5202; Otjimbingue, 1938, 1♂, leg. Boss, No. 5392; Namibflähe, 1938, 1♂3♀, leg. Boss, No. 5364; Okahandja, 1952, 1♀; Kaoko Veld, 1juv., I.X.1955, leg. Gaesdes; 1♀, 1956, 1♂, 1958, leg. Gaesdes.
- Parabuthus* sp.
 ?, Windhuds, 1♀, 1909 (rev. M. Vachon, 1976 No. VA 1453, det. B. Lamoral).
- Rhopalurus agamemnon* (C. L. Koch, 1840)
Brazil, Piañhy, 12.I.1914, 2♂3♀ (holotype and paratypes of *Rhopalurus iglesiasi* Werner, 1927), leg. Bresslau, Nos 5280 and 5315; 1♂, No. 680/9.
- Rhopalurus junceus* (Herbst, 1800)
Cuba, 1♀, No. 6652/60.
- Rhopalurus laticauda* Thorell, 1876
Colombia, Dept. Magdalena, Santa Marta, 2♀, 29.VI.-31.VII.1966, 1juv., 20.VII.-20.VIII.1966; Dept. Magdalena, Bahia de Guairaca, Tayrona Park, 26.VII.1985, 1juv., 31.X.1985, 1♀, leg. H.-G. Müller, Nos. 37027 and 37028. **Venezuela**, Ciudad Bolívar, 2♀1im., leg. T. Lünig, No. 5150; Merida, 2♂3♀, No. 5712/27; Maracay, 1♂2♀, No. 8876/218; Maracay, 1♀, No. 29208; San José de Guaviare, 1♀, XII.1955, leg. Meden.
- Tityus* cf. *argentinus* Borelli, 1899
Bolivia, La Paz, 1♀, No. 8877/219. **Peru**, 2♀, No. 5369; Mapir-Fluss, 1888, 1im., leg. Emmel, No. 5159; Olmos u. Jaen, 1550-1800 m, 10.-11.IV.1953, 1im., leg. Koepcke, No. 11028.
- Tityus* cf. *bahiensis* (Perty, 1834)
Argentina, Entre Ríos, Puerto Marguez, La Paz, 2♀, 14.I.1950, leg. Leers.
Brazil, São Paulo, 2♀, No. 8046/161; from Inst. Butantan (Bücherl), 9.X.1959, 4♀, No. 11322; São Paulo, 1♀, 12.XII.1954; São Paulo, 2♀, II.1962, leg. K. Friedrich.
- Tityus clathratus* C. L. Koch, 1843
Venezuela, Maracay, 1934, 10♀23juv. before 1st ecdysis (holotype and paratypes of *Tityus fahrenheitzi* Roewer, 1943), leg. Fahrenholtz, No. 6651/59.
- Tityus columbianus* (Thorell, 1876)
Colombia, 7♀, No. 39229; 7♀.
- Tityus costatus* (Karsch, 1879)
Brazil, Therezopolis, 7.I.1914, 1♀ (holotype of *Tityus bresslaui* Werner, 1927), leg. E. Bresslau, No. 5158; Nova Teutonia, 1♂ (holotype of *Tityus novateutoniae* Roewer, 1943), No. 6263/42; Nova Teutonia, 27°11'S, 52°23'W, 2juv., leg. F. Plaumann, No. 6654/62; Nova Teutonia, 1♂1♀, No. 6742/149.
- Tityus discrepans* (Karsch, 1879)
Venezuela, Caracas, 1897, 1♀, leg. Müller, No. 5157.
- Tityus* cf. *evandroi* Mello-Leitão, 1945
Brazil, Tiriyo-Maloca am, Rio Tamirin, Serra de Tunucumaque, 1♀, 17.II.1961, leg. Sattler.

- Tityus* cf. *nematochirus* Mello-Leitão, 1941
Colombia, Monterre-dondo, unter Steinen, 1300-1800 m, XII.1955, 9♀3juv..
- Tityus paraensis* Kraepelin, 1896 (= *T. cambridgei* Pocock, 1897)
Guyana, 1♀, No. 8048/163. **French Guiana**, Tonate, 20.X.1985, 1♂ (im.), leg. Kock.
Surinam, Paramaribo, 1913, 2♂, leg. G. Hartmann, No. 5391.
- Tityus pococki* Hirst, 1907
Venezuela, Puerto Cabello, 1♀, No. 30641.
- Tityus rugosus* Schenkel, 1932
Venezuela, Timotes, 1♀(im.), No. 8049/164.
- Tityus stigmurus* (Thorell, 1876)
Brazil, Pernambuco, 24.VI.1914, 1♀, leg. Bresslau, No. 5160; Penha, 24.VI.1914, 1♀, leg. Bresslau, No. 5161; from Inst. Butantan (Bücherl), 9.X.1959, 4♀, No. 11321, 1♀, No. 31486, 1981, 1♀, 31487; São Paulo, Ribeirão, Preto u. Umgebung (450 km w. São Paulo), II.-VI.1968, 11♀1im., leg. Bücherl, No. 24485;
- Tityus tayrona* Lourenço, 1991
Colombia, Dept. Magdalena, Bahía de Guairaca, Tayrona n. p., 13.VI.1985, 1♂ (holotype), No. 37019, 8.X.1985, 1♀ (allotype), No. 37024, 19.VI.1985, 1juv. (paratype), No. 37023, 12.VII.1985, 1♂1♀1juv. (paratypes), No. 37022, VIII.1985, 1♀ (paratype), No. 37026, 30.IX.1985, 3♂4♀3juv. (paratypes), No. 37025, 31.X.1985, 1♀ (paratype), No. 37021, 6.XI.1985, 1♂ (paratype), No. 37020, leg. H. G. Müller.
- Tityus trinitatis* Pocock, 1897
Trinidad and Tobago, Tobago, 1♀, leg. A. Seotz, No. 5170.
- Tityus trivittatus* Kraepelin, 1898
Argentina, La Plata, 1♀, No. 8047/162. **Paraguay**, San Bernardino, 1juv. after 2nd ecdysis, 1911, 1♀, 13.I.1913, 1juv. after 2nd ecdysis, 21.VIII.1913, 1♀, 3.III.1914, leg. A. Fischer.
- Tityus* cf. *zulianus* González-Sponga, 1981
Venezuela, Timotes, 2♀1juv., No. 5713/28.
- Tityus* sp. ("groupe *bolivianus*")
Peru, Hda Taulis (06°50'S, 79°10'W), 1700 m, 1im., leg. Koepcke, No. 10656; Hda Monteseco (06°50'S, 79°10'W), 1200 m, 2.I.1953, 1juv., leg. Koepcke, No. 11084; La Florida, Rio Saua, 1200 m, 25.IV.1954, 2juv., leg. Koepcke, No. 10981.
- Tityus* sp.
Brazil, 1juv. (very damaged), L. von Heyden; Lago do Jarici, Amazonas, Rio Negro, 1♀, II.1927, leg. Ekrhardt.
- Tityus* sp.
?, Westindien, 1♀, leg. G. Salomon.
- Uroplectes fischeri* (Karsch, 1879)
?, O. Afrika, 1♀, leg. Knippes.
- Uroplectes* cf. *fischeri* (Karsch, 1879)
Mozambique, Tete, 16♂12♀1juv., IV.1947. ?, ? D. O. Afrika, 1♀, 1936, leg. Dr. Kohl.
- Uroplectes flavoviridis* Peters, 1862
R. South Africa, Transvaal, Kruger-Park, 1931, 1♂2♂(im.)1juv., leg. F. Haas, No. 5174.
- Uroplectes lineatus* (C. L. Koch, 1843)
R. South Africa, Natal, Durban, 1♀, No. 6693/100.
- Uroplectes occidentalis* Simon, 1876
Congo, Banana, Mündung, 1876, 2♀, leg. P. Hesse, No. 5162.
- Uroplectes otjimbinguensis* (Karsch, 1879)
Namibia, Okahandja, 1951, 1♂, 1955, 1♂1♀, V.1955, 1juv., leg. Gaesdes.
- Uroplectes pilosus* (Thorell, 1876)
Namibia (SW Afrika), Lüderitzbucht, 1♂3♂(im.), No. 5985/37; Farm Okatji-Komu, 1♂(im.), 27.X.1952, leg. Waterbery.
- Uroplectes planimanus* (Karsch, 1879)
Namibia, Windhoek, 1♀, No. 6279/58; Windhoek, 1♀(im.), No. 8871/213; Lüderitzbucht, 1♂, No. 8872/214; 1♂(im.); Weluritschia-Zone a. SW Rand der Braundberge, 1♀, 15.-16.X.1952, leg. R. Martens; Evongo, 1♂, 1956, leg. Gaesdes; N.O. Kalahari, Ahaberge, 1♂1♀, VII.1953, leg. Yourdes; Okahandja, 1♂1♀, 1951, 2♂2♀4juv., V.1953, leg. Yourdes, 1♂1♀, 1956, 2♀, leg. Gaesdes; Königstani, 1♂, 11.VI.1956, leg. Gaesdes; Windhoek, Garten, II.1986, 1♀, leg. B. Mracky. ? **Namibia**, 1♂(im.), No. 5172.
- Uroplectes* cf. *planimanus* (Karsch, 1879)
Namibia, Okahandja, 2♀1juv., leg. Gaesdes, 2♀1juv., 1958, leg. Gaesdes, 1♂, V.1955.

Uroplectes tumidimanus Lamoral, 1979
Namibia, Berseba, 1♂, No. 6692/99.
Uroplectes cf. *vittatus* (Thorell, 1876)
Mozambique, Tete, 1♀, IV.1947, No. 10090.
Uroplectes sp.
R. South Africa, Transvaal, Barbeston, 1♂(im.), No. 6694/101.
Uroplectes sp.
Namibia, Windhoek, Garten, II.1986, 1juv., leg. B. Mracky.
Vachoniolus globimanus Levy, Amitai & Shulov, 1973
 ?, 1♂ no locality.

Chactidae Pocock, 1893

Broteochactas nitidus Pocock, 1893
Trinidad, 1♂, No. 8055/170.
Chactas (*Euchactas*) *aequinoctialis* (Karsch, 1879)
Colombia, Bogotá, 1♀, No. 8057/172; Dept. Magdalena, Santa Marta, N. Sierra Nevada, Nähe San Pedro de La Sierra, 16.VIII.1985, 1♀1im., leg. H.-G. Müller, Nos 37011 and 37030; Dept. Magdalena, Santa Marta, N. Sierra Nevada, Nähe San Lorenzo, 23.VIII.1985, 4♀1juv., leg. H.-G. Müller.
Chactas (*Brachychactas*) *brevicaudatus* (Karsch, 1879)
Colombia, Dept. Magdalena, Bahia de Guairaca, Tayrona Park, 13.VI.1985, 1♂, leg. H.-G. Müller, Nos 37029.
Chactas cf. *lepturus* Thorell, 1876
 ? **Colombia**, 2♂4♀4juv.
Chactas cf. *vanbenedeni* Gervais, 1844
Colombia, La Tagua, 1juv., 13.-14.V.1956.
Teuthraustes cf. *atramentarius* Simon, 1878
Ecuador, 1♀, No. 8059/174.
Teuthraustes sp.
Colombia, Dept. Magdalena, Sta Marta, N. Sierra Nevada, El Campano aus Fallaub, 1000 m, 1juv., 20.IV.1986, leg. H. G. Müller.

Chaerilidae Pocock, 1893

Chaerilus variegatus Simon, 1877
Indonesia, Lombok, Tengengeak, 2♂3♀, 1909, Sunda Exped. des Frankf., leg. J. Elbert, Nos 5380 and 5303; Java, Idien-Geb, 1♀, No. 6731/138.

Diplocentridae Karsch, 1880

Didymocentrus hummelincki Francke, 1978
Lesser Antilles, Bonaire Island, 2♀1im.1juv., No. 8054/169.
Didymocentrus krausi Francke, 1978
El Salvador, Dept. La Union, 1km nach Abzweigung des Str. nach Conchagua, 11.IX.1951, 1♀(im.), holotype, leg. A. Zilch, No. 8791.
Didymocentrus lesueurii (Gervais, 1843)
Lesser Antilles, Santa Lucia, 2♀, No. 8053/168.
Nebo hierichonticus (Simon, 1872)
Palestine, Jerusalem, 1962, 1♀(im.), leg. Celo, No. 13020.
Nebo cf. *hierichonticus* (Simon, 1872)
 ?, 1♀(?)1juv. no locality.
Nebo cf. *yemenensis* Francke, 1980
Yemen, 1♀(im.), No. 6699/106.

Euscorpiidae Laurie, 1896

Euscorpius (*Euscorpius*) *carpathicus* (Linnaeus, 1767)
Croatia, Dalmatia, Ragusa, 1♂3juv., No. 7703/156; Rovijn, 1902, 4♂10♀3juv., leg. R. Römer, No. 5136; Rovijn, 1905, 2♀, leg. F. Winter, No. 5101; Dalmatia, Cherso Island, 1juv., leg. Strasser, No. 6264/43, 3juv., No. 6265/44; Rovijn, 1910, 2♂5♀, leg. E. Pfaff, No. 5144; Dalmatia, 3.I.1911, 1♀, leg. E. Rödiger, No. 5134; Umbegung von Rovigno, 1.-13.IV.1956, 1♂5♀2juv., No. 25923; Island near Rovinj, IV.1956, 1♂1♀, leg. Kraus, No. 25935; Istria,

Puzzi-Höhle bei Abbazia, 1juv., No. 8486/181; Rovinj, IX. 1958, 1im., No. 25906; Rovinj, VIII.-IX.1974, 1♂, No. 30979; NW Rovinj, Weise, 2.IV.1962, 1♂7♀4juv., leg. G. Strack, No. 12953; NW Rovinj, Maccie, 7.IV.1962, 3♀1juv., leg. G. Strack, No. 12954; Hangö Pazin, 12.IV.1962, 2♀, leg. G. Strack, No. 12951; Rovinj (Istria), 13.IV.1962, 1♂, leg. G. Strack, No. 12956; Hvar Island, Macchie, 19.IV.1962, 1♀1im., leg. G. Strack, No. 12952; Jrnotski, 23.IV.1962, 1♀, leg. G. Strack, No. 12955; Rovinj, Machie, IV.1962, 1♀, leg. G. Strack, No. 12950. **France**, Cannes, Côte d'Azur, IX.1954, 1♀, leg. Schirner, No. 25924. **Greece**, Rhodos, 1♀, No. 6267/46; Crete, Chania, V.1926, 1♀1juv., leg. F. Roewer, No. 6272/51; Crete, Aptera, V.1926, 1♀, leg. F. Roewer, No. 6274/53; Crete, Attika, Pentelli, V.1926, 3♀, leg. F. Roewer, No. 682/11; Crete, Akrotiri, Katholiko-Höhle, V.1926, 2♀, leg. F. Roewer, No. 8844/186; Crete, Governeto-Kloster, V.1926, 1♀, leg. F. Roewer, No. 8445/180; Crete, Akrotiri, Arkalo-Höhle, V.1926, 1♀, leg. F. Roewer, No. 8846/188; Crete, Lakkos, VI.1926, 2♂2♀, leg. F. Roewer, No. 675/4; Crete, Topolia, VI.1926, 1♂4♀, leg. F. Roewer, No. 681/10; Crete, Topolia, VI.1926, 3juv., leg. F. Roewer, No. 6275/54; Crete, Meskla, Panageia-Quelle, VI.1926, 2♀, leg. F. Roewer, No. 6276/55; Crete, Phurnes, VI.1926, 2im., leg. F. Roewer, No. 8842/184; Crete, Topolia-Höhle, VI.1926, 1♀, leg. F. Roewer, No. 8843/185; Crete, Akrotiri, Kumaro-Höhle, VI.1926, 1♂, leg. F. Roewer, No. 8845/187; Crete, Meskla (Schlucht-Abhang), VI.1926, 1♀, leg. F. Roewer, No. 8847/189; Skiathos, 28.VI.1978, 1♀, leg. Liebegott, No. 30978; N Sporaden, 5.VII.1978, 1♀, leg. Kock, No. 30977, 1juv., No. 30780; Pevonna bei Toannina, 17.III.1961, 1juv., leg. Winter, No. 25936; N. Sporaden, 16.V.1979, 1♀, 19.V.1979, 2♀1juv., 22.V.1979, 1juv., 23.V.1979, 1♀, 27.V.1980, 1♂1juv., leg. S. Liebegott, Nos 30903 - 30909. **Italy**, Brenta-Tal, 2♀, No. 2473/22; Sardinia, Subol, 1juv., No. 10702/254; Nizza, 2♀, leg. Firman, No. 5140; Malta, Zurrigo, 1♀, No. 6738/145; Sicilia, Palermo, 1886, 3♀, leg. C. Hirsch, No. 5137; Rapallo, 1957, 1♀, leg. Rau, No. 25925; Liguria, Torre Paponi, 200m, 43°50'11"N, 07°55'48"E, 1♀, 21.III.1978, leg. D. Kock; Varazze, 28.III.1959, 2♀(im.), leg. Simon, No. 25926. **Romania**, Mehadia, 2♂20♀, leg. Matic, No. 24517; Baia de Arama, 1juv., leg. Matic, No. 25927; Mănăstirea, Muntele Cozia, 1955, 2♀, leg. Matic, No. 25933; Băile Herculane, 1956, 2♀, leg. Matic, No. 25932; 1♀, No. 38497. **Spain**, Mallorca, 1♀, No. 684/13; Mallorca, Palma, X.1951, 1♂1♀, leg. Peters, No. 25930; Balearen, Porrosa, 1♂1♀, No. 683/12. **Tunisia**, 1906, 1♂1♀, leg. Pfaff, Nos 5117 and 5129. **Turkey**, 1♀, leg. L. Heyden, No. 5135; Istanbul, 1941, 1juv., leg. Bott, No. 25910. ?, Bordighera, 3♀, No. 5141; Prinkipo Island, 1♂4♀, No. 6735/142; Ibessalien, Pelion bei Velos, 1♂2♀, No. 6737/144; Prinkipos, 1888, 1♀, leg. Retowski, No. 25929, 1♂1♀, No. 5147; Krain, 17.V.1896, 1♀, leg. A. Weiss, No. 5146; Riviera, 1910, 1♀, leg. O. Boettger, No. 5149; Genua, 6.III.1912, 1♂3♀2juv., leg. S. Nick, No. 5148; Insel Lacroma near Regusa, 2♀, leg. Löw-Beer, No. 5139; Brioni, 29.V.1913, 3♀, leg. Löw-Beer, No. 5143; Kap Ferrat, 9.II.1914, 1♂1♀1juv., leg. Löw-Beer, No. 5145; Portofino, 1914, 5♂9♀3juv., leg. L. Nikl, No. 5133; Skiathos Asellina, 26.IX.1982, 2♀A, leg. M. Turuny; error label " **R. South Africa**, Zululand, Umfolosi, Camp Masimba, IX.1952, leg. Schmidt, 3♂4♀.

Euscorpius (Euscorpius) carpathicus canestrinii (Franzago, 1872)

Italy, Sardinia, Desulo, 1952, 1♂1♀, No. 25931, M. Vachon, 1976 (VA 1341).

Euscorpius (Euscorpius) germanus (C. L. Koch, 1837)

Austria, Tirol, Innichen, 1♀, No. 5120; Tirol, Ala, 1♀, No. 5986/38; Tirol, Galitzer-Klamm bei Lienz, 1♂, leg. Zilch, No. 25899; Tirol, Heuben, 800 m, 1♀1im., leg. Zilch, No. 25900; Tirol, Zw. Bozen, Klobenstein, 24.VI.1911, 1♀, leg. E. Schwarz, No. 5119; Tirol, Grödner-Tal, VIII.1913, 1♂4♀1juv., leg. R. Herzberg, Nos 5113 and 22093; Tirol, Grödner-Tal, VII.1914, 1♀, leg. M. Stellwag, No. 5118; S. Tirol, St. Valentin/Etsch, 1500 m, VIII.1958, 1♂2♀, leg. Klausewitz, No. 25902; Tirol, Unterpeischlach bei Heuben, VII.1964, 3♀, leg. Zilch, No. 25901. ?, Kärnten, Villach, 1♂1♀, No. 6736/143.

Euscorpius (Euscorpius) mingrelicus (Kessler, 1874)

Georgia, Kaukasus, Karabagh-Gau, 1♀, leg. Valentin, No. 5115. **Turkey**, Aksehir, 15.IV.1960, 1♀, No. 25934; Karybische Grotte, 26.-27.III.1966, 4im., leg. Dobat, No. 25893. ?, Mendelpass, 1♀, leg. A. Weis, No. 5114; Steiermark, Bürg Schleinitz, 1905, 1♂1♀, leg. Heyden, No. 5116.

Euscorpius (Polytrichobothrius) italicus (Herbst, 1800)

Albania, Tirana, 2♀, No. 6733/140; Tafalebene, 1939, 2♀, leg. K. Müller, No. 5382. **Austria**, Tirol, 1♂1♀, leg. S. Heyden, Nos 5109 and 25907; Tirol, Bozen, 26.V.1904, 1♂1♀, No. 5107. **Croatia**, Dalmatia, Lissa, 1♂, No. 6734/141; Rovinj, 1902, 2♂2♀1juv., leg. F. Römer, No. 5108; Rovinj, 1905, 1♂, leg. F. Winter, No. 5138; Rovinj, 1910, 1♂, leg. E. Pfaff, No. 5111; Rovinj, 1.-13.IV.1956, 1♀3juv., No. 25904; Rovinj, IX. 1958, 1im., No. 25906; Istria, Rovinj,

13.IV.1962, 1juv., leg. G. Strack, No. 12957. ? **France**, Brioni, 29.V.1913, 1♂2♀, leg. Löw-Beer, No. 5105. **Germany**, Tessin (introduced), 1♀, IX.1959, 1♀, leg. Mertens, Nos 25903 and 25909. **Italy**, Verona, 1juv., leg. Leuwer, No. 6268/47; Verona, 1912, 1♂1♀, leg. Hobrecht, No. 5112. **Turkey**, 1♂, leg. Heyden, No. 5106; Constantinopel, 21.VI.1888, 1♂, 1888, 1juv., leg. Retowski, No. 25905 and 25908; Istanbul, 1941, 1juv., leg. Bott, No. 25910. ? **Turkey**, Frankfurt (a.d. Turkey), 1903, 1♂, leg. G. Meyer, No. 5104. ?, Pegli, 1♂, leg. Schiller, No. 5110; 1♀, No. 24513; Lussin-Piccolo, 8.V.1911, 1♀, leg. S. Lehrs, No. 5103; Morea, Vityna, VIII.1926, 1im., No. 6271/50; erroneous label “? Kenia“, 1♂; Istria, 1990, 1♂, leg. Leffler.

Euscorpius (Tetratrichobothrius) flavicaudis (De Geer, 1778)

France, Hyeres, 1♂, leg. A. Gwinner, No. 5122; Corse, 1905, 1♀1im., leg. Richters, No. 5121; Nîmes, Amphitheater, 18.VI.1958, 1♀, No. 25911. ? **France**, Pyreneen, 2♂1♀, No. 8952/236. **Italy**, Lucca, 1904, 1♀, leg. L. Heyden., No. 5131; Rom (Palatin), 1906, 1♀, leg. Arani, No. 5123; Sardinia, Sassari, 4.IV.1952, 1♀4juv., No. 25919, 5.IV.1952, 2♀1juv., No. 25914; Sardinia, Lago buni, 11.IV.1952, 1♂4♀3juv., No. 25918; Sardinia, Castel Sardo, 15.IV.1952, 1♀1im., No. 25912; Sardinia, Bunorva, 15.IV.1952, 3♀1juv., No. 25916; Sardinia, Urgini, 17.IV.1952, 1im., No. 25913; Sardinia, Sassari, IV.1952, 1♂3♀9juv., No. 25915, 4♀3juv., No. 25920; Sardinia, Sassari, Fledermaushöhle, 6.V.1952, 2♀1juv., No. 25422; Varazze, 28.III.1959, 1♀, leg. Simon, No. 25917; Sardinia, 12.VIII.1961, 1♀, No. 25921; Toscana, Lucca, Cour San Leonardo in Treponzia, San Ginese, 1♀, 14.VIII.1988, leg. D. Kock. ?, Bormes, Deo. Var., 2♀1juv., leg. Oppenheim, No. 5132; 1899, 1♂, leg. Dönitz, No. 5130; Monsummano, 1914, 1♂1♀1juv., leg. S. Hobrecht, No. 5102.

Megacormus gertschi Díaz Najera, 1966

Mexico, Hidalgo, 1juv., 14.IV.1946, leg. H. Wagner.

Hemiscorpiidae Pocock, 1893

Hemiscorpius lepturus Peters, 1862

Iran, Alewaz (Khonsistan), 1♂1♀, 1959, leg. Frank.

Hemiscorpius socotranus Pocock, 1899

Yemen, Socotra, Adho-Demellus, 1♀, No. 6710/117.

Heteroscorpionidae Kraepelin, 1905

Heteroscorpion opisthacanthoides (Kraepelin, 1896)

Madagascar, Nossibé, 1898, 1im., leg. Ebenau, No. 5173.

Ischnuridae Simon, 1879

Cheloctonus crassimanus (Pocock, 1896)

R. South Africa, Butterworth, 1♀, No. 6729/136.

Cheloctonus jonesii Pocock, 1892

R. South Africa, Zululand, Natumu (nordöstl. Dongola-River), 1♂1♀(im.), No. 6728/135.

Hadogenes taeniurus (Thorell, 1876)

Namibia, Okahandja, 1955, 2juv., leg. Gaeldes; Kaoko Veld, 1.IX.1955, 1juv., leg. E. v. Koener.

Hadogenes tityrus (Simon, 1888)

Namibia (SW Afrika), Waterberg, 1juv. (holotype of *Hadogenes bifossulatus* Roewer, 1943), No. 6739/146; Lüderitzbucht, 1♂(im.)1♀(im.), Nos 5988/40 and 8889/231.

Hadogenes trichiurus (Gervais, 1843)

R. South Africa, Grahamstown, 1♀, No. 6725/132.

Hadogenes troglodytes (Peters, 1862)

R. South Africa, Transvaal, Letaba Camp, 4.-11.IX.1931, 2♀1juv. (holotype and paratypes of *Hadogenes troglodytes letabensis* Werner, 1933), Nos 5345 and 5346; Transvaal, Korugs Park, Letaba Camp, 28.VIII.1952, 1♀.

Hadogenes sp.

Namibia, 3juv., 24.IX.1952.

Iomachus laeviceps (Pocock, 1890)

India, Nilgiris, 2♂4juv., No. 1089/20; Dekan, Madras, 1♀, No. 6727/134.

Iomachus politus Pocock, 1896

Mozambique, 1♂, No. 6726/133. **Namibia**, Windhoek, V.1912, 2♀, leg. F. Schmidt, No. 5183; Swakopmund, V. 1912, 1♂, leg. F. Schmidt, No. 5183 (loc. in error ?). **?**, Tonga Island, 1♀, No. 5984/36 (loc. in error ?).

Liocheles australasiae (Fabricius, 1775)

Australia, Rimitara Island, 1909, 4♀, leg. E. Wolf, No. 5377. **Indonesia**, Celebes, 3♀, No. 5715/30; W. Borneo, 2♀, leg. F. Wille, No. 5216; Amboina, 1♀, No. 6730/137; Halmaheira, Galela, 1894, 2♀, leg. Kükenthal, No. 5195; Halmaheira, Soah Konorra, 1894, 3♀, leg. Kükenthal, No. 5192; Halmaheira, Oba, 1894, 4♀, leg. Kükenthal, No. 5193; Halmaheira, Patani, 1894, 1♀, leg. Kükenthal, No. 5194; Borneo, Baranfluss, 1894, 5♀2juv., leg. Kükenthal, No. 5191; Sumatra, Bandar Kwela, 1900, 1♀, leg. V. Auer, No. 5199; Roembi-Muskoka, 1♀1juv., 1909, Sunda Exped. des Frankf., leg. J. Elbert. **?** **Indonesia**, Nine, 2♀1juv., 9.VI.1909, Levuka, Ovalon, 1♀, VI.1909, Laeuassa (?), 1♀, 7.IX.1909, Feis, W. Carolinen, 1♀, 21.-22.IX.1909, Makotea Paumota (?), 2♀3juv., 1909, Levuca, 2♀, 1909, Hanseatische Südsee Expedition, leg. Wolf; W. Java, Tjibodas, 1400 m, 2♀5juv., 5.V.1927, leg. S. Ueberer; W. Java, Tjibodas, 4600 m, 3juv., 13.-25.VI.1957, leg. A. M. R. Wegner; Warelana (?), 1juv., 11.VI.1959. **Indonesia** (or **Malaysia**), Borneo, 1♀, leg. Well; Borneo, Baramfluss, 1894, 1♀, leg. Kükenthal, No. 5213. **Malaysia**, Selangor, Staat um Kuala Lumpur, 1♀2juv., III.1961, 2♀, 11.IV.1961, leg. U. Klingel; Batu Höhle, XII.1961, 1♀, leg. Klingel; Bali, 1♀, leg. Altmann. **Melanesia**, Solomonen, Apia, 1909, 5♀2juv., leg. E. Wolf, No. 5376. **Myanmar**, Burma, Mt. Victoria, 1♀, No. 9784/158. **New Guinea**, Eitape Island, 3♀, No. 8892/234. **Papua New Guinea**, Palmen plantage 15 km E Madarg, 1♀, 5.IX.1990, leg. D. Mebs. **Philippines**, Luzon, Mt. Maquiling, 1♀9juv., No. 6266/45, 10♀2juv., No. 6744/151. **Samoa**, Upolu, Aistr. Apia, IV.1966, 1♀, leg. Marschall. **Tahiti**, 2juv., 27.VII.1909, 1♀, 28.VII.1909, Hanseatische Südsee Expedition, leg. Wolf. **?**, 2♀, No. 5218; Batjan, 1894, 12♀6juv., leg. Kükenthal, No. 5215; Key, Doelala, VI.1908, 1♀, leg. H. Merton, No. 5208; Aroe, Umgebung v. Ngaigoeli, II.1908, 1juv., leg. H. Merton, No. 5190; Aroe, Manoembai, Kobroor, III.1908, 1♀, leg. H. Merton, No. 5196; Elat, Gross-key, VI.1908, 1♀, No. 5188, 9.VI.1908, 1♀1juv., No. 5210, 10.VI.1908, 7♀, No. 5197, leg. H. Merton.; Look Jus, Mittiero, 1909, 3♀, leg. E. Wolf, No. 5374; Savage-Jus, Nirce, 1909, 4♀2juv., leg. E. Wolf, No. 5375; Lombok, Swela, 362 m, 1909, 1♀, leg. J. Elbert, No. 5217; Lombok, Sadjang, 29.IV.1909, 2♀1juv., leg. J. Elbert, No. 5198; Lombok, 1909, 2juv., leg. J. Elbert, No. 5189.

Liocheles karschii (Keyserling, 1885)

New Guinea, Sitape, 1juv., 14.IX.1909, Hanseatische Südsee Expedition, leg. Wolf.

Liocheles waigiensis (Gervais, 1843)

Indonesia, Halmaheira, 1♂, No. 8890/232; Halmaheira, Patani, 1894, 3im., leg. Kükenthal, No. 5200; Halmaheira, 2200, 1894, 1♀(im.), leg. Kükenthal, No. 5201. **Melanesia**, Solomon, Buka, 1908, 1♀, No. 5378. **?**, Admiralitäts Islands, Manus, 1juv., No. 8891/233; Doerdjela Island, Aru, Wämmer, 1♀, leg. H. Merton, No. 5204, det. Kraepelin as *Hormurus papuanus*; Elat, Gross-key, 2♀2im., leg. H. Merton, No. 5349, det. Kraepelin as *Hormurus caudicula keyensis*.

Liocheles cf. *waigiensis* (Gervais, 1843)

Australia, Bramston Beach, 5.V.1957, 1♀2juv., leg. Felten.

Opisthacanthus (*Nepabellus*) *africanus* Simon, 1876

Cameroon, Molundu, 1911, 1juv., leg. Schultze, No. 5285. **Congo**, Fr. Kongo, Quesso, II.1910, 1juv., leg. Schubotz, No. 5284.

Opisthacanthus (*Nepabellus*) *asper* (Peters, 1862)

R. South Africa, 1♂, No. 5300; N. Transvaal, Mica, 1♀, 4.IX.1952; Zululand, Umfolosi, Camp Masimba, IX.1952, 1♂1♀2juv., leg. Schmidt.

Opisthacanthus (*Nepabellus*) cf. *asper* (Peters, 1862)

?, O. Afrika, 1juv., XII.1953, leg. K. L. Koch.

Opisthacanthus (*Nepabellus*) cf. *laevipes* (Pocock, 1893)

R. South Africa, Transvaal, Melelane Camp, 1931, 1juv., leg. F. Haas, No. 5279.

Opisthacanthus (*Nepabellus*) *madagascariensis* Kraepelin, 1894

Madagascar, 1885, 1juv.(♂), leg. Stümpf, No. 5301; Tananarive, Liaterit, Steppe, 1300 m, 1♂(im.), 26.III.1960, leg. K. L. Koch; Ouest, Ampanily, Xerophytenbrusch, 30 juv., 5.V.1960, leg. K. L. Koch; Kalkplateau bei Bevoalava, 2.VI.1960, 2♀(im.), leg. K. L. Koch.

Opisthacanthus (*Nepabellus*) cf. *punctulatus* Pocock, 1896

Madagascar, W, Kusta, Moroudava, X. 1960, 1♀1juv., leg. K. L. Koch.

Opisthacanthus (Nepabellus) rugiceps Pocock, 1897

Tanzania, O. Afrika, Tanga, 1♀, No. 6724/13; Kilimandjaro, Moschi, 1897, 1♂, leg. Nolte, No. 5295.

Opisthacanthus (Nepabellus) cf. rugiceps Pocock, 1897

Tanzania, Dar-es-Sallam, Tanganyika Territory, 1juv., 8.IX.1954, No. 489/1.

Opisthacanthus (Nepabellus) validus Thorell, 1876

R. South Africa, Kap der Guten Hoffnung, 1im., No. 5302.

Opisthacanthus (Opisthacanthus) elatus (Gervais, 1843)

?, Indonesia, Halmahera, 1894, 1♂, leg. Kükenthal, No. 30640 (loc. in error ?).

Opisthacanthus (Opisthacanthus) lecomtei (Lucas, 1858)

Cameroon, Edea, 1♀, No. 6723/130; Victoria, Idenau-Pflanzuy, 1♀, leg. O. Volley, No. 5292.

Paleocheloctonus pauliani Lourenço, 1996

Madagascar, Ampotaka, Primärer Dornwald, 2juv., 26.V.1960, leg. K. L. Koch.

Iuridae Thorell, 1876

Hadruroides charcasus (Karsch, 1879)

Peru, b. Olmos, 06°00'S, 79°40'W, 200 m, 7.IV.1953, 1♂, leg. Koepcke, No. 8758; Weg Ohmos-Jacu, 600 m, 13.IV.1953, 1♀, leg. Koepcke, No. 8761. **Panama**, (loc. in error ?), 1♀, No. 5281.

Hadruroides galapagoensis Maury, 1974

Galapagos, 1♀, No. 8052/167; 2♀, leg. Eibel-Eibesfeldt, No. 25959; S-Seymour (Baltra), 15.VII.1957, 1♀1juv., leg. Eibel-Eibesfeldt, No. 25948; Duncan, 28.VII.1957, 1♀2juv., leg. Eibel-Eibesfeldt, No. 25945; James, James-Bay, 3.VIII.1957, 2juv., leg. Eibel-Eibesfeldt, No. 25954; Barrington, 31.VIII.1957, 1♀, leg. Eibel-Eibesfeldt, No. 25946; Charles, Bleach Reach, 20.IX.1957, 1♂2♀, No. 25955, 2♂2♀, No. 25956, leg. Eibel-Eibesfeldt; Akademiebucht, 17.VII.1957, 1♀(im.), No. 25953, VII.-IX.1957, 2im., No. 25952, leg. Eibel-Eibesfeldt; 8 mil NW Akademiebucht, 21.X.1957, 2im., leg. Eibel-Eibesfeldt, No. 25947; Narborough, VI.-X.1957, 1♂(im.), leg. Eibel-Eibesfeldt, No. 25951; Albemarle, Essex Point, 14.X.1960, 2im., leg. Eibel-Eibesfeldt, No. 25950; Santa Cruz Island, Academy Bay, Darwin Research Sta., 12.II.1964, 2♀3im., leg. Cavagnaro & Schuster, No. 25958; James, James-Bay, 8.III.1966, 3♀2im., leg. Eibel-Eibesfeldt, No. 25941; S-Seymour (Baltra), 1966, 1♀, No. 25944; 1966, 2♀, leg. Frühjahr, No. 25942.

Hadruroides lunatus (L. Koch, 1867)

Peru, Silla de Paita, Küste, 14.IX.1950, 1♀, leg. Koepcke, No. 8744; Lomas v. Atocongo b. Lima, 12.VIII.1950, 1♂1♀2juv., No. 8743, 15.IV.1951, 1♂1♀, No. 8745, 18.IV.1951, 1♂, No. 8752, 1juv., No. 8753, 28.X.1951, 4♂8♀8juv., No. 8748, 20.XI.1951, 2♂3♀, No. 8750, 18.IV.1952, 2♂4♀8juv., No. 8754, leg. Koepcke; Lomas v. Lachay b. Chamcay, 25.X.1951, 1♀1juv., No. 8747, 8.XI.1951, 7♂10♀4juv., No. 8746, leg. Koepcke; Puente Piedras, Larentanilla, 18.XI.1951, 1♂3♀, leg. Koepcke, No. 8749; Wald v. Zárate b. San Bartholome, 2700 m, 10.IV.1952, 1♀, leg. Koepcke, No. 8751; Hda. Llayuen, 07°40'S, 78°40'W, 1800 m, 12.XII.1952, 1♂1♀, No. 8755, 1♂1juv., No. 8756, leg. Koepcke; b. Olmos, 06°00'S, 79°40'W, 200 m, 7.IV.1953, 2♀1juv., No. 8757, 8.IV.1953, 4juv., No. 8759, 9.IV.1953, 1♀, No. 8760, leg. Koepcke; Oberh. Santa Eulalia, 1250 m, 3.VI.1953, 1♂2♀1juv., leg. Koepcke, No. 8765; b. Autiska oberh. Lima, 450 m, 3.VI.1953, 1♀, leg. Koepcke, No. 8764; Autisha oberh. Lima, 2100 m, 3.VI.1953, 1im., leg. Koepcke, No. 8766; Wald v. Zárate oberh. Lima, 2700 m, 25.VI.1953, 1♀1juv., leg. Koepcke, No. 8762; b. Huanta, Andemabh, 2400 m, 29.X.1953, 2juv., leg. Koepcke, No. 8768; Matucama oberh. Lima, 2500 m, 23.IX.1953, 2juv., leg. Koepcke, No. 8773; Weg Oknos-Jaen, 13.IV.1953, 3juv., leg. Koepcke, No. 8762; Huariquina b. Matucana, 2600 m, 18.II.1954, 1♀, leg. Koepcke, No. 8770; Mirados Lives, 1050 m, 17.IV.1954, 1♂, No. 8771, 3juv., No. 8772, leg. Koepcke; Lomas v. Lachay b. Chavcay, 10.XII.1954, 1im., leg. Koepcke, No. 8769; San Bartolomé oberh. Lima, 2000-2200 m, 22.V.1955, 4im.2juv., leg. Koepcke, No. 8763. ?, 5im., No. 25957.

Hadrurus arizonensis Ewing, 1928

Mexico, Tampico (loc. in error ?), 1♀, No. 8051/166. **USA**, Arizona, 1♀, No. 8050/165.

Iurus asiaticus Birula, 1903

Turkey, Ovackick, 1♀, No. 6732/139; Belemdek Mara, Baracken, 1914, 1♂1♀2im., leg. Fahringses, No. 24518; Giglikara, 1680 m, 2♀, leg. Felten, No. 25890; Karybische Grotte, 26.-

27.III.1966, 6im.2juv., leg. Dobat, No. 25893; Pazarkoy, sö von Egridir, 1400 m, 27.V.1966, 1♀, leg. Felten, No. 25892. ?, ohne Fundortangabe, 1♀, No. 25891.

Iurus dufourei (Brullé, 1832)

India, Dekkan, Anamalai (loc. in error ?), 1♂ (holotype of *Chaerilomma dekanum* Roewer, 1943), No. 8893/235.

Scorpionidae Latreille, 1802

Heterometrus (Chersonesometrus) fastigosus Couzijn, 1981

India, Assam, 1♂1♀1juv. (holotype and paratypes), No. 8886/228.

Heterometrus (Chersonesometrus) fulvipes (C. L. Koch, 1837)

India, Madras, 1889, 1♂1♀1juv., leg. S. Kolb, No. 5347.

Heterometrus (Chersonesometrus) granulomanus Couzijn, 1981

India, Palni-Hills, Kadai-canal, 1♂ (paratype), No. 5332.

Heterometrus (Chersonesometrus) pelekomanus Couzijn, 1981

India, Deccan, Nilgiris, Maharashtra, 2♂ (holotype and paratype), No. 1088/19; Bombay, Deccan, 1♂2♀18juv.(10♂8♀) (paratypes), No. 329.

Heterometrus (Gigantometrus) swammerdami Simon, 1872

India, Madras, 1889, 1♂, leg. Th. Kolb, No. 5334; Malabar, Puddapoddy, 1♀, leg. O. Lotichius, No. 5333; Malabar-Küste, 1♂1♀, No. 8885/227; Lanooli, 1911, 1♀1juv., leg. Low-Beck, No. 5320. **Sri Lanka**, Ceylon, Kandy, 1♂, No. 6703/110; Ceylon, Paradenya, 2juv., No. 8853/195; Ceylon, Estata Beritardi, 24.I.1914, 1juv., leg. J. Mastbaum, No. 5304.

Heterometrus (Heterometrus) bengalensis (C. L. Koch, 1841)

Myanmar, Prome, 1♀ (det. Couzijn, 1977), No. 7986/160.

Heterometrus (Heterometrus) laoticus Couzijn, 1981

Laos, Karen-Dorf, ca 8 km SE Luang Prabang, 18.XII.1964, 1♀.

Heterometrus (Heterometrus) liophysa (Thorell, 1888)

Indonesia, Sumatra, Padang, 2♂(im.), No. 5278; Sumatra, Bunga Bondar, 1911, 1♂, 28.X.1911, 2♂, leg. Schütze, No. 5323 and 18158.

Heterometrus (Heterometrus) liophysa laevifrons Roewer, 1943

Indonesia, Mentawai Isl., Siberut, 2juv. (male holotype, female paratype), No. 8883/225; Sumatra, Nias, 1♀, leg. P. Beyer, No. 5322.

Heterometrus (Heterometrus) longimanus (Herbst, 1800)

Indonesia, Java, Idien-geb, 3♀. No. 6743/150; Sumatra, Padang, 1♂, No. 6702/109; Sumatra, 2juv., leg. S. Auer, No. 5291; Sumatra, Fort de Kock, 1♂1♀, No. 8814/183; Sumatra, Deli, 1879, 2♂1♀, leg. V. Schauler, No. 5328; Sumatra, 1886, 1♀, leg. Hochwiesner, No. 5329; Sumatra, Deli, 1892, 2♂2♀1im., leg. Benecke, No. 5348; West Borneo, Pontianak, 1893, 2♂2♀6juv., leg. F. Will, No. 5324; Halmahera, 1894, 5♂5♀4im., leg. Kükenthal, No. 5350; Sumatra, 1900, 1♀1im., leg. V. Guer, No. 5327; Sumatra, Hügelland Boelaeh Blang-Cra, Lho Seumawe, Atjeh, 1929, 1♂2♀1juv., leg. Rookmaaker, No. 5368; Sumatra, Lippisches Landes, 26.VII.1954, 4♂3♀5juv. **Malaysia**, Borneo, Baramfluss, 1894, 3im.13juv., leg. Kükenthal, Nos 5325 and 5326.

Heterometrus (Heterometrus) longimanus belitungensis Couzijn, 1981

Indonesia, Bangka, 2♀2juv. (paratypes), No. 5330.

Heterometrus (Heterometrus) petersii (Thorell, 1876)

?, Cochinchina, V.1872, 1♀, No. 5331.

Heterometrus (Heterometrus) cf. petersii (Thorell, 1876)

?, label in error "Colombia, Sta Marta, leg. Kickhefel", 1♂.

Heterometrus (Javanimetrus) cyaneus (C. L. Koch, 1836)

Indonesia, Java, Matang, 1♀, No. 6705/112; Java, Idien-geb, 2♂2♀. No. 6743/150; Sumatra, Fort de Kock, 1♀, No. 8814/183; Sumatra, Deli, 2♀3im., leg. Heyden, No. 5316; Java, Buitenzorg, 3♀, No. 8884/226; W. Java, Djasinga, 1929, 1♂2♀, leg. Wolf, No. 5362; Java, 1933, 1juv., leg. F. Ohaus; Java, 4.X.1961, 4juv. (im.). **Philippines**, Luzon, Mt. Maquiling, 1♂1♀(holotype and paratype of *Heterometrus petersi luzonensis* Couzijn, 1981 **Syn. n.**), No. 8882/224. ?, Usambara (loc. in error), 1♀, No. 6707/114.

Heterometrus (Srilankametrus) indus (Geer, 1778)

India, Dekan, Nilgiris, 1im., No. 6704/111, 1juv., No. 1087/18; Dekan, Travankore, 2juv., No. 8881/223. **Sri Lanka**, Ceylon, 1847, 1♀1juv., leg. G. Worms, No. 5319; Ceylon, 1912, 1♀1♂1juv., leg. A. Hansen, No. 5317; Ceylon, IV.1914, 1♂2♀, leg. J. Mastbaum, No. 5318. ?, Hyderabad, Banjara Road, 1931, 1♀, leg. S. Mirza, No. 5367; ? Java (loc. in error ?), Mus. Leiden, 1♀, No. 5321.

- Opisthophthalmus* cf. *capensis* (Herbst, 1800)
?, Ägypten (loc. in error), 1♂1♀, leg. E. Rüppell, No. 5294.
- Opisthophthalmus carinatus* (Peters, 1862)
Namibia (SW Afrika), Chnosgebirge, 1♀, leg. F. Rintelen, No. 5297; Aus, 1♂; Windhoek, 1♂1♀2juv., leg. K. Schliermann, No. 5342; Lüderitzbucht, 1♂1♀(im.), No. 6718/125; Windhoek, 2♀, No. 8840/182, 1♂3♀, No. 8858/200; Swakopmund, 1909, 1♀, leg. F. Rintelen, No. 5296; 1909, 1♀, leg. Leonhardi, No. 5341; Aukas, 1909, 1♂1juv., No. 5343; Koelmanshoop, 1913, 1♂, leg. S. Hardt, No. 5298; Koelmanshoop, III. 1913, 2♀, leg. H. Lotz, No. 18157; Schinxfläche, 1938, 1♂2♀, leg. Boss, No. 5359; Namibfläche, 1938, 2♂2♀, leg. Boss, No. 5360; Maltahöhe, 1938, 2im., leg. Boss, No. 5361; Marienthal, 1938, 2♂, leg. Boss, No. 5363; Okahandja, 1951, 2juv., IX.1952, 1♀, V.1953, 1juv., V.1955, 3juv., leg. Gaesdes; Okahandja, X.1955, 1♂1♀, leg. Gaesdes, No. 9647; b. Okahandja, 1957, 1♂1♀, leg. Gaesdes, No. 10531. ?, 1♀, No. 5299.
- Opisthophthalmus* cf. *carinatus* (Peters, 1862)
Namibia, Ahaberge, VII.1953, 5juv., leg. Gaesdes; Kaoko Veld, I.IX.1955, 1juv., leg. E. v. Koener; Okahandja, 1juv., 1956, leg. Gaesdes.
- Opisthophthalmus gigas* Purcell, 1898
Namibia (SW Afrika), Lüderitzbucht, 1♀, No. 6717/124.
- Opisthophthalmus glabrifrons* Peters, 1862
R. South Africa, Grahamstown, 1♂, No. 6721/128. ? **Zimbabwe**, Rhodesia, Salisbury, 1♂, No. 6722/129.
- Opisthophthalmus holmi* (Lawrence, 1969)
Namibia, Sandünen bei Koicheb, 12.II.1973, 1♂, leg. B. Lamoral, No. 29295.
- Opisthophthalmus karrooensis* Purcell, 1898
R. South Africa, Beaufort West, 1♂1♀, No. 6720/127.
- Opisthophthalmus latimanus* C. L. Koch, 1841
R. South Africa (S Afrika), Kei Bridge, 1♀, No. 6719/126.
- Opisthophthalmus* cf. *latimanus pugnax* Thorell, 1876
R. South Africa (S Afrika), Port Elizabeth, 1♂, No. 6716/123.
- Opisthophthalmus* cf. *litoralis* Lawrence, 1955
Namibia, 1♂, 1956, leg. Gaesdes.
- Opisthophthalmus opinatus* (Simon, 1888)
Namibia (SW Afrika), Kunene, 3♀, No. 6715/122. ?, 1♀, ded. 1888, No. 30643.
- Opisthophthalmus schultzei* Kraepelin, 1908
Namibia (SW Afrika), Lüderitzbucht, 1juv.(♀) (holotype of *Opisthophthalmus laevicauda* Roewer, 1943), No. 6741/148.
- Opisthophthalmus wahlbergii* (Thorell, 1876)
Namibia (SW Afrika), Lüderitzbucht, 1♂1♀, No. 8888/230; Swakopmund, 1909, 1♂11juv., No. 5344; 1938, 2♂, leg. Boss, No. 5358.
- Opisthophthalmus* sp.
Palestina (loc. in error ?), 1♂.
- Opisthophthalmus* sp. (possibly several species)
Namibia (SW Afrika), Koetmanshoop, 2juv., leg. Hardt, No. 5288; Okahandja, 1957, 2juv., leg. Gaesdes, No. 10354; Chuosgebirge, 2juv., leg. Rintelen, No. 5287; 1juv., 15.-16.X.1952; Windhoek, 1juv., 31.X.1952. **R. South Africa**, Karroo, 3juv., No. 8849/191.
- Pandinus* (*Pandinoides*) *cavimanus* (Pocock, 1888)
Kenya, 1♀. **Namibia** (SW Afrika), Windhoek, 1912, 1♂2♀, leg. F. Schmidt, No. 5339 (loc. in error?). **Sudan**, Lado Distr., Dufile, 1♀, No. 6709/116. ?, O. Afrika, 3♀, leg. F. Kinkelin, No. 5340.
- Pandinus* (*Pandinopsis*) *dictator* (Pocock, 1888)
Cameroon, Duala, 16.XII.1913, 2♂1♀1im., leg. A. Haas, No. 5335; Edea, 1♂, No. 6708/115. ?, Inner Afrika, Ufer J. Niger, 1♂, leg. A. Melly, G. Heyden, No. 5336.
- Pandinus* (*Pandinurus*) *exitialis* (Pocock, 1888)
Eritrea ?, Erythraea, 1juv., No. 6706/113.
- Pandinus* (*Pandinurus*) *viatoris* (Pocock, 1890)
Mozambique, Tete, IV.1947, 4juv. **Namibia**, Tabora, 1913, 1♂1♀(im), No. 5338 (loc. in error?). **Tanzania**, O. Afrika, Tanga, 1♀(im), No. 8859/201; Kilimatinda, 1904, 2♂, leg. Belzing, No. 5337; Mateteback, 1200 m, 2♂, leg. Kohl-Larsen, No. 5365; Hohenloho-Graben, 1932, 1♀1im., leg. Kohl-Larsen, No. 5366. ?, 1♀, No. 39008.

Pandinus (Pandinus) imperator (C. L. Koch, 1841)

Ivory Coast, Atidian, 1juv., leg. D. Satlien. **Togo**, Misahöhe, 1♀, No. 6711/118; Sansanne Mangu, 1♂, No. 8887/229. ?, 1♀, No. 37586; 8juv. before 1st ecdysis, ZOO Frankfurt, No. 35512; W. S. 158, Schausammlung, 1♀; Fernando Poo, 1963, 1♀.

Scorpio maurus Linnaeus, 1758

Algeria, Ain Sefra, 1♂1♀, No. 6712/119. **Iran**, Ahwaz, 1961, 1♀, leg. Schübert, No. 12051. **Iraq**, Baghdad, 2♂6♀4juv.; N., Shakalawa, VII.1953, 1♀, leg. K. T. Khalaf. **Israel**, Haifa, 1886, 3♀, leg. H. Simon, No. 5289. **Libya**, 1♀, leg. Brandt. **Morocco**, Hoher Atlas, Marakech, Tiznit, 18.IV.1968, 1♀, leg. P. Taitzig; 1♀(im.), VI.1991, leg. Wirth, No. 37112. **Namibia**, Okahandja, Sukkes, 1♀, 1952, leg. Martens (loc. in error ?). **Syria**, 1839, 1♀6juv., No. 5286; Abou Houreira, a. Euphrat, 1♂2♀, leg. Celso, No. 13027; Syria, zoologisches garden, 3♀; Nahr-al-Habur Area, 35°37'N 40°45'E, Tall Shaih Hamad, 2♀1im.9juv., 21.-24.IX.1988, TSH 1/88; Nahr-al-Habur Area, 36°24'N 40°49'E, Tall Budairi, 1♀, 26.IX.-8.X.1988, TSH 9/88; 6.X.1961, 1♀. **Tunisia**, 1906, 1♂, leg. Pfaff, No. 5290; Remi Black, 21.VII.1914, 1♀; km 64 S Gabes, 1♀, 1956, leg. Kaltenbach; Gabés, 1juv., 15.-30.III.1961, leg. Walch. **Turkey**, Kleinasien, Amanus-Geb., 1♀, No. 6713/120. **Yemen**, 1♀1im, No. 6714/121. ?, N.W. Afrika, 1884, 3♀, leg. Kobelt, No. 5275; 1♂, No. 5277; 1969, 2juv., leg. Kluge and Theissig, No. 34545; 1♂; 1♀.

Scorpiopidae Kraepelin, 1905

Scorpiops dastychi Kovařík, 2000

India, Himalaya, Molta, 3.000 m, Deutsche Indien-Expedition 1955–57, leg. G. A. von Maydall, 6.V.1956, 1♂ (paratype No. 6).

Scorpiops longimanus Pocock, 1893

India, Assam, 1♀, No. 6685/95.

Scorpiops petersii Pocock, 1893

India, a. d. Nachlass Eidmann, 1♂, No. 4415d.

Scorpiops tibetanus Hirst, 1911

?, Kambu batsi, 12.IV.1939, 1♂6♀9juv., leg. N. Eidmann.

Urodacidae Pocock, 1893

Urodacus armatus Pocock, 1888

Australia, Alice Springs, 26.III.1957, 1juv., leg. Felten.

Urodacus cf. armatus Pocock, 1888

Australia, Darling Range, 50 km E Perth, 11.I.1957, 1juv., 2.II.1957, 1juv., leg. Felten.

Urodacus hoplurus Pocock, 1898

Australia, West-Australien, Lancefield, 1♂, No. 6700/107; Central-Australien, 1908, 1♂3im., leg. Leonhardi, Nos. 24515 and 24516; Emily Sop, E Alice Springs, 8.IV.1957, 1♂, leg. Felten.

Urodacus cf. hoplurus Pocock, 1898

Australia, Palen Valley b. Hermanus-?, 1♀, 4.IV.1957, leg. Felten.

Urodacus manicatus (Thorell, 1876)

Australia, Neu-Süd-Wales, Bendigo, 1♀, No. 6701/108; Yalgor, 1907, 1♀, leg. H. Görling, No. 5175; Adelaide, 1♀, 10.III.1957, leg. Felten; Adelaide, 1♀, 16.III.1957, leg. Felten; 30 mil E Adelaide Spr., 1♂, 28.III.1957, leg. Felten.

Urodacus novaehollandiae Peters, 1862

Australia, Marianen, Saipan, 1juv. (holotype of *Urodacus marianus* Roewer, 1943), No. 8878/220.

Urodacus cf. yaschenkoi (Birula, 1903)

Australia, central, Tnatata, 4juv., leg. Leonkardi.

Vaejovidae Thorell, 1876

Paruroctonus becki (Gertsch & Allred, 1965)

USA, Idaho, Buttle Co., Arco, 8.VIII.1969, 2♂1♀, leg. M. M. Cazier, det. Francke, 1976, No. 29199.

Paruroctonus boreus (Girard, 1854)

USA, Nevada, Washoe Co., 7.5 miles west of Nixon, 19.VIII.1969, 2♂1♀, leg. Bigelow, det. Francke, 1974, No. 29201.

- Paruroctonus utahensis* (Williams, 1968)
 USA, Utah, 3 miles ONO Bluff San Juan Co., 1969, 1♂, leg. M. A. Cazier, No. 29202.
- Smeringurus mesaensis* (Stahnke, 1957)
 USA, California, San Bernardino Co., Death Valley Natl. Mnt. Saratona Springs, 11.VI.1970, 1♂, leg. Francke, No. 29207.
- Uroctonus mordax* Thorell, 1876
 Ecuador, 2♀, No. 8060/175 (loc. in error ?).
- Vaejovis carolinianus* (Beauvois, 1805)
 USA, Alabama, 2im., No. 8061/176.
- Vaejovis coahuilae* Williams, 1968
 USA, Texas, Brewster Co., Big Bend Natl. Park, Rio Grande Village, 17.VI.1974, 1♂1♀, leg. Cazier and Francke, No. 29205.
- Vaejovis confusus* Stahnke, 1940
 USA, Arizona, Maricopa Co., Mesa, 14.V.1971, 2♂1♀, leg. O. F. Francke, No. 29206.
- Vaejovis intrepidus cristimanus* Pocock, 1898
 Mexico, 1♀, Mus. Hamburg, No. 5186.
- Vaejovis spinigerus* (Wood, 1863)
 USA, Arizona, Pinal Co., Florence, 30.V.1975, 2♀(im.)1juv., leg. R. Smith, No. 29204.
- Vaejovis vorhiesi* Stahnke, 1940
 USA, Arizona, Cochise Co., 5 miles W Portal, 5.VI.1974, 2♀, leg. O. F. Francke, No. 29203.

Discussion of the faunistic data published by Roewer (1943)

Revision of specimens identified by Roewer (1943) has revealed a number of errors, of which those listed below resulted in species appearing in a country where they in fact do not occur or where their occurrence is doubtful.

Parabuthus capensis (Ehrenberg, 1831) apparently does not occur in Namibia as assumed by Werner (1902: 598) and Roewer, but only in the Republic of South Africa. Specimens from Namibia that Roewer (1943: 207) identified as *P. capensis* are hereby assigned to *Parabuthus kraepelini* Werner, 1902 and *Parabuthus raudus* (Simon, 1888).

Parabuthus granulatus (Ehrenberg, 1831) does not occur in Kenya, specimens so identified by Roewer (1943: 207) are *Parabuthus pallidus* Pocock, 1895.

The occurrence of *Tityus androcottoides* (Karsch, 1879) in Venezuela is doubtful, as the female so identified by Roewer (1943: 219) in my opinion is *Tityus rugosus* Schenkel, 1932.

Specimens of *Tityus carinatoides* Mello-Leitão, 1945 (nec *Tityus carinatus*) from Brazil (Roewer, 1943: 219) are hereby assigned to *Tityus bahiensis* (Perty, 1834).

Specimens of *Tityus lutzi* Giltay, 1928 (= *Tityus trivittatus lutzi*) from Argentina (Roewer, 1943: 219) in my opinion are *Tityus trivittatus* Kraepelin, 1898.

Specimens of *Tityus magnimanus* Pocock, 1897 from Venezuela (Roewer, 1943: 219), which Lourenço (1987: 568) regarded as *Tityus pococki* Hirst, 1907, show characters of *Tityus zulianus* González-Sponga, 1981. Definite identification of these species will require a separate revision.

The female of *Opisthacanthus asper* (Peters, 1862) from Tanzania (Roewer, 1943: 234) belongs to *Opisthacanthus rugiceps* Pocock, 1897.

Specimens of *Heterometrus liurus* (Pocock, 1897) from Sri Lanka (Roewer, 1943: 228) are juveniles of *Heterometrus swammerdami* Simon, 1872.

The specimen of *Pandinus militaris* Pocock, 1900 from Sudan (Roewer, 1943: 229) is *Pandinus cavimanus* (Pocock, 1888). I have examined the types of both species and conclude that *Pandinus militaris* Pocock, 1900 is a junior synonym of *Pandinus cavimanus* (Pocock, 1888).

Discussion

Since even specialists on a given group of scorpions do not always agree on species relations, examination of a single museum collection cannot resolve questions of this nature. Among taxonomically difficult complexes are the *Tityus* “group *bolivianus*” or the Venezuelan group comprising *Tityus magnimanus*, *T. pococki*, and *T. rugosus* (see González-Sponga, 1996 and Lourenço, 1987). Resolution of these and many other matters is beyond the scope of this work, which cannot do more than to inform specialists of the presence of specimens that possess characters relating them most closely to the species named above. It will allow other specialists to use the collection for solving particular taxonomic problems.

A real impediment to the value of the collection is the uncertainty about the correctness of some labels. In some instances the labels are quite certainly incorrect, e. g. for *Babycurus jacksoni* (Pocock, 1890) (Nos. 5293 and 5314 have labels: SW Africa: Windhoek, V.1912, leg. F. Schmidt), *Buthus occitanus* (Amoreuxi, 1789) (male label: USA, Texas, leg. Tips), *Uroctonus mordax* Thorell, 1876 (No. 8060/175 label: Ecuador), or *Opisthacanthus elatus* (Gervais, 1843) (No. 30640 label: Indonesia, Halmahera, 1894, leg. Kükenthal). Some specimens unfortunately lack locality data altogether.

A problem which concerns not just this but all older museum collections is the state of preservation of some specimens, which after 50 to over 100 years in alcohol are completely devoid of pigment.

Acknowledgments

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Addendum

In the period between completion of the checklist and its submission there occurred several taxonomic changes which necessitate additional comments. For instance, specimens from Cyprus identified as *Mesobuthus gibbosus* (Brullé, 1832) probably are *Mesobuthus cyprius* Gantenbein & Kropf, 2000.

Newly described or designated species of the genus *Euscorpius* are very difficult to interpret. This concerns *Euscorpius beroni* Fet, 2000, *Euscorpius gamma* Caporiacco, 1950 (both in the *Euscorpius mingrelicus* group), *Euscorpius alpha* Caporiacco, 1950 (*Euscorpius germanus* group) and *Euscorpius tergestinus* (C.L. Koch, 1837) (*Euscorpius carpathicus* group). Taking geographic distribution into account, I surmise that of these species only *Euscorpius tergestinus* could be present in the revised collection, amongst specimens identified as *Euscorpius carpathicus*.

Species such as *Euscorpius gamma* or *Euscorpius alpha* are likely to be identifiable in museum collections only tentatively and so will tend to lower the importance of the collection. To be more specific, with solitary specimens or only small series it is impossible to separate e.g. *Euscorpius alpha* from *Euscorpius germanus*.

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Spiders associated with economic plants in Sohag, Egypt

Metwally, A.M.¹, El-Naggar, M.E.², Mowafi, M.H.¹ and Mohafez, M.A.¹

¹ Faculty of Agriculture, Al-Azhar University, Cairo, Egypt

² Plant Protection Research Institute, Agric. Research Center, Cairo, Egypt

Abstract

A survey study was carried out during two successive years (October 1997-October 1999), to determine the presence of spiders on 10 different crops. This study was conducted in seven districts of Sohag governorate (Akhmim, El-Baliana, El-Maragha, El-Menshah, Gerga, Johyna and Sohag). Collected spiders were classified into 19 families. All the identified taxa are here recorded for the first time from Sohag governorate.

Introduction

Spiders are found almost everywhere on earth, from arctic islands to dry desert regions. They are particularly abundant in areas of rich vegetation. They invade cultivated areas looking for prey (almost pests of crops). Hence, the study of spiders is very important economically. This work is a two years survey in seven districts of Sohag governorate. A study achieved for the first time in this governorate of Upper Egypt. The spider species, genera and even families are here recorded for the first time from Sohag (El-Hennawy, 1990 & 1992).

The studies on spiders in cultivated areas of Egypt are few.

1. Negm *et al.* (1976) surveyed spider population at a clover field in Assiut. They found that the families: Salticidae, Tetragnathidae and Thomisidae were the most abundant followed by Linyphiidae, Clubionidae and Lycosidae. They mentioned that although population size of spiders varied greatly throughout the growing season of clover, there was gradual increase until late May when a peak was reached (i.e. maximum). Also, they indicated that peak activity occurred at noon during January and February and 08.00 am or both during April and May.

2. Rahil (1988) recorded 11 families of spiders from El-Fayoum governorate associated with two field crops (cotton and cucumber). The collected spiders were identified to 20 genera and 22 species.
3. Sallam (1996) collected spiders representing 17 families (only 15 species and 24 genera were identified) in Giza governorate, during a study on 15 crops through the years 1992-1994. The same data was revised and published by Shereef *et al.* (1996).
4. Ghabbour *et al.* (1999) surveyed spiders in 18 different crops in Menoufiya governorate, using pitfall traps. They recorded 10 spider families on winter crops. Lycosidae was the dominant family constituting about 80% followed by Linyphiidae, Philodromidae, Gnaphosidae and Tetragnathidae.

The aim of this study is to widen the scope of spider studies in cultivated areas of Egypt.

Material and Methods

A survey was carried out in seven districts at Sohag governorate: Akhmim, El-Baliana, El-Maragha, El-Menshah, Gerga, Johyna and Sohag. About 70 acres of orchard and field crops (including vegetables) were surveyed (10 acres per district). It continued for two years, from October 1997 to October 1999. Orchards of citrus, fig, grape, guava and mango in five districts (Akhmim, El-Maragha, El-Menshah, Gerga, and Johyna) were surveyed. Field crops (broad bean and corn) and vegetables (pepper, potato and tomato) in two districts (El-Baliana and Sohag) were also surveyed.

Spiders were collected at daytime by two methods: 1. branch shaking over reversed umbrella for arboreal spiders (from trees, grasses and other field crops). 2. hand collecting for ground spiders.

Collected spider specimens were separated, examined under stereoscopic binocular microscope, and preserved in 70% ethanol. Identification of spider families followed the key and descriptions of Petrunkevitch (1939). Identification of genera and species was conducted by Mr. H.K. El-Hennawy (Cairo).

Results

The samples of spiders collected from fields of vegetables, field crops and fruit trees cultivated in seven districts at Sohag governorate are presented in Table (1) to show the presence of 23 spider species belonging to 20 genera and 19 families of suborder Labidognatha. These families are: Agelenidae, Araneidae, Dictynidae, Filistatidae, Gnaphosidae, Hersiliidae, Linyphiidae, Lycosidae, Miturgidae, Oecobiidae, Oonopidae, Philodromidae, Pholcidae, Pisauridae, Salticidae, Sparassidae, Theridiidae, Thomisidae and Uloboridae. They varied in their densities and frequencies of occurrence according to the type of cultivated plant.

However, the families Miturgidae, Philodromidae, Salticidae, Theridiidae and Uloboridae were represented in most surveyed localities with relatively high population density (19.28 - 37.57) and frequency of occurrence (71.42 - 100%).

On the other hand, the families Araneidae, Dictynidae, Gnaphosidae, Hersiliidae, Linyphiidae, Lycosidae, Thomisidae were found in most examined localities with moderate population density (6.14 - 13.85).

Table 1: Population density and frequency of occurrence of spider families and species associated with certain economic plants in seven districts of Sohag governorate.

Taxa	Spider population density							Average population density		Frequency of occurrence %
	Akhmim	El-Baliana	El-Maragha	El-Menshah	Gerga	Johyna	Sohag	Spider species	Spider family	
Agelenidae C.L.Koch, 1837	-	-	-	1	-	-	-		0.14	14.28
Araneidae Simon, 1895	19	7	17	13	9	25	4		13.42	100
<i>Cyrtophora citricola</i> (Forskål, 1775)	6	3	5	4	1	7	2	4.00		100
Dictynidae O.P.-Cambridge, 1871	15	1	10	4	10	5	5		7.14	100
Filistatidae Ausserer, 1867	-	-	-	-	1	-	-		0.14	14.28
Gnaphosidae Pocock, 1898	7	5	6	3	7	10	5		6.14	100
<i>Micaria</i> sp.	1	-	1	2	-	2	1	1.00		71.42
<i>Setaphis subtilis</i> (Simon, 1897)	2	3	1	-	1	-	1	1.14		71.42
<i>Synaphosus syntheticus</i> (Chamberlin, 1924)	1	-	1	-	2	-	1	0.71		57.14
<i>Zelotes</i> sp.	-	2	3	1	2	3	-	1.57		71.42
Hersiliidae Thorell, 1870	24	-	8	14	26	4	-		10.85	71.42
<i>Hersilia caudata</i> Savigny, 1825	24	-	8	14	26	4	-	10.85		71.42
Linyphiidae Blackwall, 1859	15	9	15	12	18	14	15		13.85	100
<i>Erigone dentipalpis</i> (Wider, 1834)	5	2	3	3	4	2	1	2.85		100
<i>Prinerigone vagans</i> (Savigny, 1825)	5	1	1	2	3	4	3	2.71		100
Lycosidae Sundevall, 1833	12	12	9	13	14	5	13		11.14	100
<i>Hogna ferox</i> (Lucas, 1838)	5	4	-	4	6	3	3	3.57		85.71
Miturgidae Simon, 1885	42	39	40	46	26	33	37		37.57	100
<i>Cheiracanthium isiacum</i> O.P.-Cambridge, 1874	11	8	16	15	10	7	3	10.00		100
<i>Cheiracanthium</i> sp.	15	14	5	8	3	6	7	8.28		100
Oecobiidae Blackwall, 1862	2	-	-	1	2	-	1		0.85	57.14
<i>Oecobius putus</i> O.P.-Cambridge, 1876	1	-	-	-	1	-	-	0.28		28.57
<i>Oecobius templi</i> O.P.-Cambridge, 1876	-	1	1	-	1	-	1	0.57		57.14
Oonopidae Simon, 1890	-	-	1	-	-	-	-	-	0.14	14.28
Philodromidae Thorell, 1870	13	58	12	24	48	13	42		30.00	100
<i>Thanatus albini</i> (Audouin, 1825)	2	7	3	6	8	3	9	5.42		100
<i>Thanatus</i> sp.	6	10	9	7	-	4	12	6.85		85.71
Pholcidae C.L.Koch, 1851	5	-	5	2	3	7	2	-	3.42	85.71
Pisauridae Simon, 1890	-	2	9	3	-	10	3	-	3.85	71.42

Salticidae Blackwall, 1841	15	16	35	13	26	18	12		19.28	100
<i>Plexippus paykulli</i> (Audouin, 1825)	4	4	10	-	11	5	3	5.28		85.71
<i>Thyene imperialis</i> (Rossi, 1846)	3	6	3	5	-	4	1	3.14		85.71
Sparassidae Bertkau, 1872	-	-	-	1	-	-	-		0.14	14.28
<i>Eusparassus</i> sp.	-	-	-	1	-	-	-	0.14		14.28
Theridiidae Sundevall, 1833	35	18	26	22	25	31	27		26.28	100
<i>Euryopsis acuminata</i> (Lucas, 1846)	5	3	4	10	6	8	6	6.00		100
<i>Theridion</i> sp.	8	-	2	3	4	9	11	5.28		85.71
Thomisidae Sundevall, 1833	5	16	7	9	10	6	7		8.57	100
<i>Runcinia</i> sp.	2	3	2	5	3	-	3	2.57		85.71
<i>Thomisus spinifer</i> O.P.-Cambridge, 1872	1	4	-	1	2	2	-	1.42		71.42
Uloboridae Thorell, 1869	53	-	49	53	26	48	-		32.71	71.42
<i>Uloborus walckenaerius</i> Latreille, 1806	15	-	12	11	7	6	-	7.28		71.42

The families Agelenidae, Filistatidae, Oecobiidae, Oonopidae, Pholcidae, Pisauridae and Sparassidae were found in few surveyed localities and their average of population densities were (0.14 - 3.85).

Spiders of family Miturgidae occurred and populated in Akhmim, El-Baliana, El-Maragha, El-Menshah, Johyna and Sohag (42, 39, 40, 46, 33 and 37 individuals) higher than in Gerga (26); Uloboridae occurred and populated in Akhmim, El-Maragha, El-Menshah and Johyna (53, 49, 53 and 48) higher than in Gerga (26); Philodromidae occurred and populated in El-Baliana, Gerga and Sohag (58, 48 and 42) higher than in Akhmim, Johyna, El-Maragha and El-Menshah (13, 13, 12 and 24); Salticidae in El-Maragha (35) and Theridiidae in Akhmim (35) and Johyna (31) occurred and populated higher than in other surveyed localities.

Araneidae, Dictynidae, Gnaphosidae, Linyphiidae, Lycosidae and Thomisidae occurred in all surveyed localities with relatively moderate population densities, whereas Hersiliidae occurred and populated moderately in Akhmim, El-Maragha, El-Menshah, Gerga and Johyna.

On the other hand, Oecobiidae, Pholcidae and Pisauridae had very low population densities, while Agelenidae, Filistatidae, Oonopidae and Sparassidae were recorded only once by one individual from one locality (i.e. the lowest population density: 0.14).

However, the population density and distribution of collected spider families within the surveyed localities were not uniform (Table 1).

The distribution of spider species also varied in their population densities and frequencies of occurrence according to the type of surveyed localities. Therefore, *Hersilia caudata* Savigny, 1825, *Cheiracanthium isiacum* O.P.-Cambridge, 1874, *Cheiracanthium* sp., *Uloborus walckenaerius* Latreille, 1806, *Thanatus* sp., *Thanatus albini* (Audouin, 1825), *Euryopsis acuminata* (Lucas, 1846), *Theridion* sp. and *Plexippus paykulli* (Audouin, 1825) were found in almost surveyed localities with high population densities and frequencies of occurrence. Thereupon, the calculation of average population densities and frequencies of occurrence were (10.85-71.42%), (10.00-100%), (8.28-100%), (7.28-71.42%), (6.85-85.71%), (5.42-100%), (6.00-100%), (5.28-85.71%) and (5.28-85.71%) respectively.

On the other hand, *Cyrtophora citricola* (Forskål, 1775), *Hogna ferox* (Lucas, 1838), *Thyene imperialis* (Rossi, 1846), *Erigone dentipalpis* (Wider, 1834), *Prinerigone vagans* (Savigny, 1825) and *Runcinia* sp. were occurred with moderate population densities and high frequencies of occurrence (4.00-100%), (3.42-85.71%), (3.14-85.71%), (2.85-100%), (2.71-100%) and (2.57-85.71%) respectively. While, *Zelotes* sp., *Thomisus spinifer*, *Setaphis subtilis*, *Micaria* sp., *Synaphosus syntheticus*,

Oecobius templi, *Oecobius putus* and *Eusparassus* sp. were found in low population densities and moderate frequencies of occurrence. The calculated values of such parameters were (1.57-71.42%), (1.42-71.42%), (1.14-71.42%), (1.00-71.42%), (0.71-57.14%), (0.57-57.14%), (0.28-28.57%) and (0.14-14.28%) respectively.

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Spiders of Sinai (Egypt), a list of species (Arachnida: Araneida)

Hisham K. El-Hennawy
41, El-Manteqa El-Rabia St., Heliopolis,
Cairo 11341, Egypt

Abstract

A list of spiders of Sinai is presented including 29 families, 58 genera, and 60 identified species (in addition to many unidentified genera and species). The records of spiders belong to 46 localities within 16 regions in Sinai. Code numbers of regions are used in a table of families and species and on a map of Sinai. *Micaria* sp., *Minosia simeonica* Levy, 1995 (Gnaphosidae), *Cheiracanthium canariense* Wunderlich, 1987, *Cheiracanthium mildei* L.Koch, 1864 (Miturgidae), *Ebo* sp. (Philodromidae), and *Xysticus tristrami* (O.P.-Cambridge, 1872) (Thomisidae) are here recorded for the first time from Egypt.

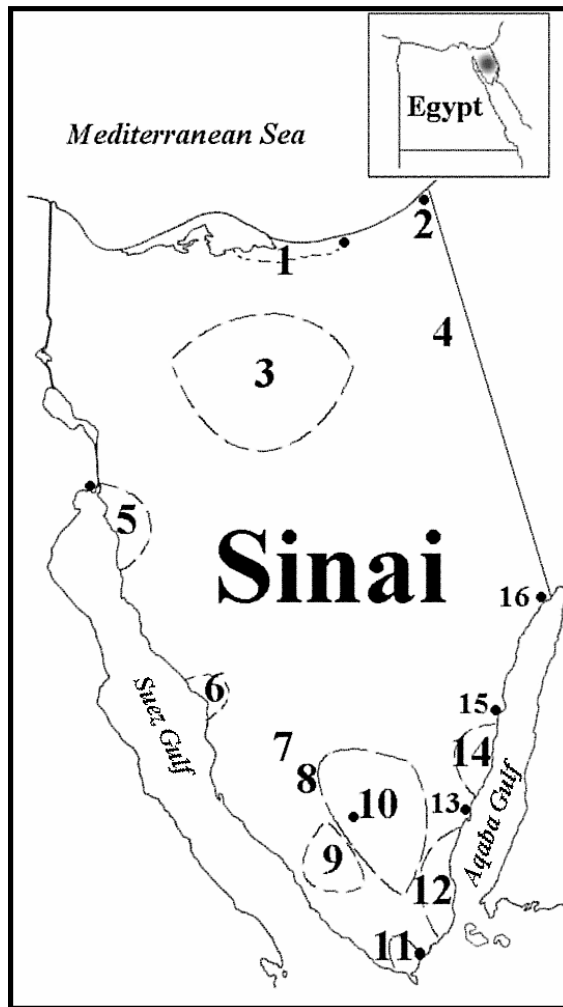
Introduction

Sinai, the northeastern corner of Egypt, is a unique situation between Africa and Asia. The study of its fauna is necessary to understand the zoogeographic relationships between Egypt's eastern desert and the Levant countries. The first work devoted to the study of spiders of Sinai was that of Octavius Pickard-Cambridge (1870).

The following work is a list of spider species collected by the author from three protected areas by Aqaba gulf (Ras Mohammed, Nabq and Abu Galoum) in 1994-1995 and El-Zaranik protectorate at the Mediterranean coast in 2000-2001; in addition to specimens collected from diverse localities in north and south Sinai, specially from the surroundings and vicinity of St. Catherine region. The old records, from literature, are also included in the list. Most of the consulted references are listed at the end of this work except those mentioned before in my checklist of 1990.

The localities (46 localities within 16 regions), in Sinai, are listed below after a code number used in: 1. the table which includes the recorded species, arranged in families and 2. the map of Sinai.

The recorded spiders of Sinai are here classified within 29 families, 58 genera, and 60 identified species (in addition to many unidentified genera and species). The taxa marked by an asterisk (*) are here recorded for the first time from Egypt.



Localities (collecting sites) in Sinai:

North Sinai

1. El-Zaranik protectorate (15 scattered sites); El-Arish
2. Rafah

Mid Sinai

3. Bir Gifgafa; Mitla pass; Vatiya pass; Qadesh Barnea' ?
4. 'Ain Jodairat

Suez Gulf

5. 'Ayun Musa; Pharaoh's Baths; Wadi Gharandel; Ras Sedr
6. 'En Higiya (NE of Abu Zneima); Abu Rudeis; southwestern Sinai

Western South Sinai

7. Wadi Feiran; Wadi Sahab
8. Gebel Serbal (Ain El-Louza)

9. Wadi Esla (5 sites)

Wadi Esla;
El-Tarfa (at start of Wadi Esla);
Sail El-No'amani (at middle of Wadi Esla);
Sahl El-Qaa' (at end of Wadi Esla);
Wadi e-'Tamaovi, NW Esla

10. St. Catherine area (15 sites)

El-Mafareq;
St. Catherine Monastery;
mountains around St. Catherine

Monastery (Sinai mountains); near General Parker Memorial;
Wadi Telah; Wadi El-Tal'aa; Wadi El-Rahba; Wadi El-Seba'iya;
Mount Sinai; Jebel Musa; Convent gardens, back of Mount Sinai;
Genneh (Jebel); Wadi El-Arbaieen; Wadi Nasb (or Wadi Nasib); Wadi Ara'am

Aqaba Gulf

11. Ras Mohammed protectorate; Sharm El-Sheikh (and Wadi Yah'med, north of it)
12. Nabq protectorate, Wadi Kid, Wadi Madsus ?
13. Dahab
14. Abu Galoum protectorate
15. Nuweiba
16. Taba region (South of Elat)

Acknowledgments

I wish to thank my friends and colleagues Drs Hassan H. Fadl, Mahmoud S. Abd El-Dayem, Magdi S. El-Hawagry, Gamal Orabi, Mostafa R. Sharaf (of Ain Shams, Cairo and Suez Canal Universities) who brought me several spider specimens from different localities of Sinai and helped me much during my trips to protected areas of Sinai.

Family and Species	Localities															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Agelenidae																
<i>Agelena lepida</i>	X						X			X		X		X		
<i>Tegenaria</i> sp.										X						
Araneidae																
<i>Agalenatea redii</i>										X						
<i>Argiope lobata</i>	X									X		X				
<i>Argiope</i> sp.	X													X		
<i>Cyclosa</i> ? sp.	X															
<i>Cyrtophora citricola</i>												X		X		
? sp.	X	X								X	X					
Dictynidae																
? sp.												X				
Dysderidae																
<i>Dysdera</i> sp.										X						
Eresidae																
<i>Stegodyphus dufouri</i>					X									X		
<i>Stegodyphus lineatus</i>	X						X			X		X		X		
Filistatidae																
? sp.				X						X		X		X		
Gnaphosidae																
<i>Micaria</i> sp.*										X	X	X				
<i>Minosia simeonica</i> *										X						
<i>Pterotricha conspersa</i>										X						
<i>Pterotricha dalmasi</i>										X						
<i>Pterotricha lesserti</i>	X				X											
<i>Pterotricha</i> sp.		X					X	X	X	X	X	X		X		
<i>Setaphis subtilis</i>							X			X						
<i>Synaphosus gracillimus</i>						X		X		X						
<i>Synaphosus minimus</i>											X		X			
<i>Zelotes listeri</i>										X						
<i>Zelotes</i> sp.	X	X					X		X	X		X		X		
? sp.	X			X						X						
Hersiliidae																
<i>Hersiliola</i> sp.										X						
Linyphiidae ?																
? sp.	X									X				X		
Liocranidae																
<i>Mesiotelus tenuissimus</i>										X						
? sp.	X															
Lycosidae																
<i>Arctosa cinerea</i>					X					X						
<i>Evippa praelongipes</i>										X						
<i>Lycosa tarentula</i>							X									
? sp.	X			X			X		X	X		X		X		
Miturgidae																
<i>Cheiracanthium canariense</i> ?*	X															

<i>Cheiracanthium mildei*</i>										X						
<i>Cheiracanthium pelasgicum</i>		X														
<i>Cheiracanthium</i> sp.	X								X	X	X	X		X		
Nemesiidae ?																
? sp.	X															
Oecobiidae																
<i>Oecobius</i> sp.											X			X		
<i>Uroctea</i> sp.										X	X	X		X		
Oonopidae ?																
? sp.	X															
Oxyopidae																
<i>Oxyopes heterophthalmus</i>										X						
<i>Oxyopes</i> sp.									X	X		X				
<i>Peucetia arabica</i>										X	X	X		X		
<i>Peucetia</i> sp.									X							
Philodromidae																
<i>Ebo</i> sp.*	X															
<i>Philodromus sinaiticus</i>					X							X	X			
<i>Philodromus</i> sp.									X	X	X	X		X		
<i>Thanatus albescens</i>										X						
<i>Thanatus</i> sp.	X	X				X				X	X	X				
Pholcidae																
<i>Holocnemus pluchei</i>										X		X				
? sp.	X									X	X					
Salticidae																
<i>Aelurillus catherinae</i>										X						
<i>Aelurillus sinaicus</i>			X													
<i>Chalcoscirtus catherinae</i>										X						X
<i>Euophrys catherinae</i>										X		X				
<i>Menemerus animatus</i>	X															
<i>Mogrus sinaicus</i>										X						
<i>Mogrus</i> sp.	X										X	X		X		
<i>Myrmarachne</i> sp.												X				
<i>Philaeus chrysops</i>										X						
<i>Plexippoides flavescens</i>										X						
<i>Plexippus paykulli</i>	X					X								X		
<i>Rafalus christophori</i>										X						
<i>Rafalus feliksi</i>									X							
<i>Rafalus</i> sp.											X					
<i>Thyene imperialis</i>											X					
? sp.	X					X		X	X							
Scytodidae																
<i>Scytodes</i> sp.	X									X		X				
Segestriidae					X											
<i>Segestria florentina</i>					X											
Sicariidae				X						X	X				X	
<i>Loxosceles</i> sp.				X						X	X				X	
Sparassidae					X	X						X				
<i>Eusparassus walckenaeri</i>					X	X				X		X				
? sp.	X									X						

Tetragnathidae <i>Tetragnatha</i> sp. ? sp.	X											X				
Theridiidae <i>Enoplognatha deserta</i> <i>Latrodectus pallidus</i> <i>Latrodectus tredecimguttatus</i> <i>Latrodectus</i> sp.? <i>Steatoda ephippiata</i> <i>Steatoda latifasciata</i> <i>Steatoda paykulliana</i> <i>Theridion musivum</i> ? sp.	X	X		X			X			X	X				X	
Thomisidae <i>Heriaeus buffoni</i> <i>Ozyptila judaea</i> <i>Ozyptila</i> sp. <i>Synema diana</i> <i>Thomisus bidentatus</i> <i>Thomisus onustus</i> <i>Thomisus</i> sp. <i>Xysticus ferus</i> <i>Xysticus lalandei</i> <i>Xysticus tristrami</i> * <i>Xysticus</i> sp.	X								X	X	X	X	X			X
Titanoecidae ? sp.				X												
Uloboridae <i>Uloborus</i> sp.	X															
Zodariidae <i>Palaestina eremica</i> <i>Ranops expers</i> <i>Trygetus riyadhensis</i> <i>Trygetus sexoculatus</i> <i>Zodarion nitidum</i> <i>Zodarion</i> sp. ? sp.	X	X					X	X		X	X	X	X		X	

Alphabetical list of identified species with author and date:

Aelurillus catherinae Prószyński, 2000
Aelurillus sinaicus Prószyński, 2000
Agelenatea redii (Scopoli, 1763)
Agelena lepida O.P.-Cambridge, 1876
Arctosa cinerea (Fabricius, 1776)
Argiope lobata (Pallas, 1772)
Chalcoscirtus catherinae Prószyński, 2000
Cheiracanthium canariense Wunderlich, 1987 *
Cheiracanthium mildei L.Koch, 1864 *

Cheiracanthium pelasgicum (C.L.Koch, 1837)
Cyrtophora citricola (Forskål, 1775)
Enoplognatha deserta Levy & Amitai, 1981
Euophrys catherinae Prószyński, 2000
Eusparassus walckenaeri (Audouin, 1825)
Evippa praelongipes (O.P.-Cambridge, 1870)
Heriaeus buffoni (Audouin, 1825)
Holocnemus pluchei (Scopoli, 1763)
Latrodectus pallidus O.P.-Cambridge, 1872
Latrodectus tredecimguttatus (Rossi, 1790)

- Lycosa tarentula* (Linnaeus, 1758)
Menemerus animatus (O.P.-Cambridge, 1876)
Mesiotelus tenuissimus (L.Koch, 1866)
Minosia simeonica Levy, 1995
Mogrus sinaicus Prószyński, 2000
Oxyopes heterophthalmus (Latreille, 1804)
Ozyptila judaea Levy, 1975
Palaestina eremica Levy, 1992
Peucetia arabica Simon, 1882
Philaeus chrysops (Poda, 1761)
Philodromus sinaiticus Levy, 1977
Plexippoides flavescens (O.P.-Cambridge, 1872)
Plexippus paykulli (Audouin, 1825)
Pterotricha conspersa (O.P.-Cambridge, 1872)
Pterotricha dalmasi Fage, 1929
Pterotricha lesserti Dalmas, 1921
Rafalus christophori Prószyński, 1999
Rafalus feliksi Prószyński, 1999
Ranops expers (O.P.-Cambridge, 1876)
Segestria florentina (Rossi, 1790)
Setaphis subtilis (Simon, 1897)
Steatoda ephippiata (Thorell, 1875)
Steatoda latifasciata (Simon, 1873)
Steatoda paykulliana (Walckenaer, 1806)
Stegodyphus dufouri (Audouin, 1825)
Stegodyphus lineatus (Latreille, 1817)
Synaphosus gracillimus (O.P.-Cambridge, 1872)
Synaphosus minimus (Caporiacco, 1936)
Synema diana (Audouin, 1825)
Thanatus albescens (O.P.-Cambridge, 1885)
Theridion musivum Simon, 1873
Thomisus bidentatus Kulczyński, 1901
Thomisus onustus Walckenaer, 1806
Thyene imperialis (Rossi, 1846)
Trygetus riyadhensis Ono & Jocqué, 1986
Trygetus sexoculatus (O.P.-Cambridge, 1872)
Xysticus ferox O.P.-Cambridge, 1876
Xysticus lalandei (Audouin, 1825)
Xysticus tristrami (O.P.-Cambridge, 1872)*
Zelotes listeri (Audouin, 1825)
Zodarion nitidum (Savigny, 1825)

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Survey and ecological studies on spiders in four governorates of Egypt

Gihan M. E. Sallam

Plant Protection Research Institute, Agric. Research Center,
Cairo, Egypt

Abstract

A survey of spiders was carried out in four governorates of both Lower Egypt (El-Qalyubia and El-Sharqia) and Middle Egypt (El-Fayoum and Beni-Suef) during the period from August 1996 to December 1998. Most of the collected species are here recorded from the four governorates for the first time. The relationship between spiders abundance, temperature and relative humidity in the four governorates was studied.

Introduction

Spiders are important natural control agents for a wide range of economically injurious pests. This study is the first survey of spiders in the orchards of olive, orange, grape and apple in four governorates of Egypt: El-Fayoum, Beni-Suef, El-Qalyubia and El-Sharqia, from August 1996 to December 1998. Spiders of 17 families including 23 genera are recorded. The relationship between both temperature and relative humidity and population of spiders in the survey locations was studied for two years. This study is a step in exploring the role of spiders in the agroecosystems of Egypt, in regions and on cultivations different from those studied by Ghabbour *et al.* (1999) in El-Menoufiya governorate.

Material and methods

Survey of spiders was carried out in four governorates; two in Lower Egypt: Toukh (El-Qalyubia governorate) and Belbis (El-Sharqia governorate); and two in Middle Egypt: Ibshiway (El-Fayoum governorate) and Sids (Beni-Suef governorate). Collecting was randomly carried out in the selected orchards every 15 days during the period from August 1996 to December 1998.

Collecting methods were beating net (branch shaking) and hand sorting for the live ground species. For olive (*Olea europea*), apple (*Pyrus malus*) and orange (*Citrus*

aurantium) trees, five trees were randomly selected and 5-10 branches of each tree were shaken five times for each sample. Olive trees branches were 120-150 cm, apple trees branches were 50-100 cm and orange trees branches were 100-125 cm long. For grapes (*Vitis quadrangularis*), 30-40 leaves were shaken over a piece of cloth. Ground spiders were collected by hand within the area of a square metre around each tree of the trees selected for shaking. Specimens were individually kept in small plastic vials and transferred to the laboratory for counting and identification to family level. Identification of genera and species was carried out by Mr. H.K. El-Hennawy (Cairo).

Results and Discussion

I. Survey

A survey on spiders inhabiting orchards of olive, orange and grapes in El-Fayoum and Beni-Suef governorates (Middle Egypt), grape, orange and apple in El-Qalyubia and El-Sharqia governorates (Lower Egypt), from August 1996 to December 1998, revealed the presence of 17 families including 23 genera and more than 25 species, from which only 13 species are identifiable (Table 1).

Table 1: Occurrence of identified spider families, genera and species in the four governorates.

Family	Genus, Species	El-Fayoum		Beni Suef		El-Qalyubia		El-Sharqia
		Ol.	Or.	Gr.	Or.	Gr.	Or.	Apple
1. Araneidae	<i>Argiope</i> sp. <i>Cyrtophora citricola</i>			X	X	X	X	X
2. Dysderidae	<i>Dysdera</i> sp.					X		
3. Eresidae	<i>Stegodyphus dufouri</i>	X						
4. Gnaphosidae	<i>Zelotes</i> sp.		X	X	X	X	X	X
5. Hersiliidae	<i>Hersilia caudata</i>		X		X			
6. Linyphiidae	<i>Erigone</i> sp.			X			X	X
7. Lycosidae	<i>Hogna ferox</i>	X	X	X	X	X	X	X
8. Mimetidae	<i>Mimetes</i> sp.	X						
9. Miturgidae	<i>Cheiracanthium isiacum</i>	X	X	X	X	X	X	X
	<i>Cheiracanthium pelasgicum</i>			X		X		
	<i>Cheiracanthium</i> sp.	X	X			X	X	X
10. Oecobiidae	<i>Oecobius navus</i>							X
11. Philodromidae	<i>Thanatus albini</i>	X	X	X	X	X	X	X
12. Salticidae	<i>Plexippus paykulli</i>					X	X	X
	<i>Synageles</i> sp.	X	X					X
	<i>Thyene imperialis</i>			X	X			X
13. Scytodidae	<i>Scytodes</i> sp.		X	X				
14. Tetragnathidae	<i>Tetragnatha</i> sp.	X			X		X	
15. Theridiidae	<i>Anelosimus aulicus</i>	X	X	X	X			X
	<i>Euryopsis</i> sp.	X	X	X	X	X	X	X
16. Thomisidae	<i>Ozyptila</i> sp.	X	X					X
	<i>Thomisus spinifer</i>	X	X	X	X	X		X
	<i>Xysticus</i> sp.							X
17. Uloboridae	<i>Uloborus walckenaerius</i>	X	X	X	X	X	X	X

Ol.= olive, Or.= orange, Gr.= grape

Alphabetical list of identified species with author and date:

Anelosimus aulicus (C.L. Koch, 1838)
Cheiracanthium isiacum O.P.-Cambridge, 1874
Cheiracanthium pelasgicum (C.L. Koch, 1837)
Cyrtophora citricola (Forskål, 1775)
Hersilia caudata Savigny, 1825
Hogna ferox (Lucas, 1838)
Oecobius navus Blackwall, 1859
Plexippus paykulli (Audouin, 1825)
Stegodyphus dufouri (Audouin, 1825)
Thanatus albini (Audouin, 1825)
Thomisus spinifer O.P.-Cambridge, 1872
Thyene imperialis (Rossi, 1846)
Uloborus walckenaerius Latreille, 1806

Table 2: Spider families on different host plants in the four governorates.

Family	Number of Individuals							Total	%
	El-Fayoum		Beni-Suef		El-Qalyubia		El-Sharqia		
	Olive	Orange	Grape	Orange	Grape	Orange	Apple		
Miturgidae	122	196	131	89	213	134	189	1074	22.78
Theridiidae	96	101	100	53	97	36	348	831	17.63
Salticidae	78	93	172	32	97	63	96	631	13.38
Philodromidae	122	91	52	67	82	58	88	560	11.88
Thomisidae	5	5	283	23	42	0	111	469	9.95
Uloboridae	94	70	10	41	11	62	14	302	6.41
Araneidae	20	26	42	35	61	30	125	339	7.19
Gnaphosidae	7	17	4	4	40	77	26	175	3.71
Hersiliidae	0	147	0	3	0	0	0	150	3.18
Lycosidae	18	16	2	63	6	6	13	124	2.63
Linyphiidae	15	5	8	0	0	1	12	41	0.87
Tetragnathidae	3	0	1	2	0	2	0	8	0.17
Scytodidae	0	2	3	0	0	0	0	5	0.11
Eresidae	2	0	0	0	0	0	0	2	0.04
Dysderidae	0	0	0	0	1	0	0	1	0.02
Mimetidae	1	0	0	0	0	0	0	1	0.02
Oecobiidae	0	0	0	0	0	0	1	1	0.02
Total	583	769	808	412	650	469	1023	4714	

Lycosidae, Miturgidae (genus *Cheiracanthium*), Philodromidae (*Thanatus*), Salticidae, Theridiidae and Uloboridae (*Uloborus*) were represented in all locations. They were the dominant families in the four governorates, followed by Gnaphosidae and Thomisidae (Table 2). The differences among the surveyed localities in relation with the number of collected spider individuals and host plant are presented in the following:

1. El-Fayoum governorate

A- Olive: The dominant families were Miturgidae (genus *Cheiracanthium*) and Philodromidae (*Thanatus*) followed by Theridiidae and Uloboridae (*Uloborus*).

B- Orange: The dominant families were Miturgidae (*Cheiracanthium*) and Hersiliidae (*Hersilia*) followed by Theridiidae, Salticidae and Philodromidae (*Thanatus*).

2. Beni-Suef governorate

A- Grape: The dominant families were Thomisidae (*Thomisus*) followed by Salticidae, Miturgidae (*Cheiracanthium*) and Theridiidae.

B- Orange: The dominant families were Miturgidae (*Cheiracanthium*) followed by Philodromidae (*Thanatus*), Lycosidae and Theridiidae.

3. El-Qalyubia governorate

A- Grape: The dominant families were Miturgidae (*Cheiracanthium*) followed by Theridiidae, Salticidae, Philodromidae (*Thanatus*) and Araneidae.

B- Orange: The dominant families were Miturgidae (*Cheiracanthium*) followed by Gnaphosidae, Salticidae, Uloboridae (*Uloborus*) and Philodromidae (*Thanatus*).

4. El-Sharqia governorate

-- Apple: The dominant families were Theridiidae followed by Miturgidae (*Cheiracanthium*), Araneidae, Thomisidae (mainly *Thomisus*), Salticidae and Philodromidae (*Thanatus*).

Table 3: Seasonal abundance of spiders on olive and orange trees at El-Fayoum governorate in 1997 and 1998.

Month	Temp. Mean °C		R.H. Mean %		Total Number of Spiders	
	1997	1998	1997	1998	1997	1998
January	16.1	13.2	55.3	69	30	26
February	15.0	15.3	52.9	64	27	23
March	17.0	17.1	53.0	59	38	20
April	20.2	23.2	51.0	54	34	30
May	26.0	28.3	51.0	54	30	25
June	28.0	27.5	57.0	54	27	28
July	29.0	31.7	57.0	55	50	40
August	28.2	29.7	60.0	57	81	80
September	26.2	30.1	59.0	57	86	81
October	23.6	26.6	59.0	58	82	79
November	18.9	21.8	62.0	64	50	47
December	14.0	16.7	69.0	67	30	23

Correlation coefficient between total number of spiders and temperature mean.

Insignificant correlation ($P = 0.1539$) in 1997; High significant ($P = 0.0081$) in 1998.

Correlation coefficient between total number of spiders and R.H. mean.

Insignificant correlation in both 1997 ($P = 0.2533$) and 1998 ($P = 0.2255$).

The rarest families were: Scytodidae (*Scytodes*) which was found in El-Fayoum and Beni-Suef governorates (5 individuals); Eresidae (*Stegodyphus*) with 2 individuals from El-Fayoum governorate; Dysderidae (*Dysdera*), Mimetidae (*Mimetus*) and Oecobiidae (*Oecobius*) with only one individual each.

The largest number of collected spiders was from apple orchard. Miturgidae (*Cheiracanthium*) had the largest number of individuals during the survey (22.78%).

Most of the collected species are here recorded from the four governorates for the first time (El-Hennawy, 1990 & 1992).

II. The relationship between population density and both temperature and relative humidity

1. El-Fayoum governorate

Results in Table (3) clearly demonstrated that the population density of spiders on Olive and Orange trees oscillated from January to June 1997. The total numbers were 27-38 individuals (mean = 31) at average temperature 15-28 °C and relative humidity 51-57 % R.H. In the second year these numbers were 20-30 individuals (mean = 25.3) at average temperature 13.2-28.3 °C and relative humidity 54-69 % R.H.

Table 4: Seasonal abundance of spiders on grape and orange trees at Beni-Suef governorate in 1997 and 1998.

Month	Temp. Mean °C		R.H. Mean %		Total Number of Spiders	
	1997	1998	1997	1998	1997	1998
January	10.4	12.3	60.4	65	13	10
February	11.0	13.9	61.7	65	24	22
March	13.1	14.3	61.0	61	41	30
April	17.1	21.1	59.0	57	30	26
May	23.4	25.6	55.0	53	34	32
June	26.5	29.9	59.0	55	39	42
July	27.9	29.0	59.0	56	52	50
August	27.4	32.2	61.0	57	106	100
September	25.5	28.3	59.0	57	92	90
October	23.3	24.0	59.0	59	56	59
November	18.4	18.7	63.0	64	54	50
December	13.2	13.3	67.0	67	32	29

Correlation coefficient between total number of spiders and temperature mean.

Significant correlation in both 1997 ($P = 0.013$) and 1998 ($P = 0.05$).

Correlation coefficient between total number of spiders and R.H. mean.

Insignificant correlation in both 1997 ($P = 0.450$) and 1998 ($P = 0.1587$).

The population then began to increase in July reaching its maximum from mid summer to mid autumn in the two successive years. The monthly total numbers during

the period August, September and October were 81-86 individuals (mean = 83) in 1997 at average temperature 23.6-28.2 °C and relative humidity of 59-60 % R.H. In the second year these numbers were 79-81 individuals (mean = 80) at average temperature 26.6-30.1 °C and relative humidity 57-58 % R.H.

Statistically analyzed data indicated that insignificant positive correlation existed between the population density of spiders and both temperature and relative humidity in the first year. In the second year there was a high significant positive correlation between the population density of spiders and temperature while the relative humidity did not show any significant correlation (Table 3).

2. Beni-Suef governorate

Results in Table (4) clearly demonstrated that the population density of spiders gradually increased from January to July 1997. The total numbers were 13-52 individuals (mean = 33.3) at average temperature 10.4-27.9 °C and relative humidity 55-61.7 % R.H. In the second year these numbers were 10-50 individuals (mean = 30.3) at average temperature 12.3-29.9 °C and relative humidity 53-65 % R.H.

Then the population reached its maximum in August and September during the two successive years (106, 92 individuals in 1997 and 100, 90 in 1998), at average temperature 25.5-27.4 and 28.3-32.2 °C and relative humidity 59-61 and 57 % R.H. in the two successive years, respectively. The population then decreased reaching its minimum in January and February.

Table 5: Seasonal abundance of spiders on grape and orange trees at El-Qalyubia governorate in 1997 and 1998.

Month	Temp. Mean °C		R.H. Mean %		Total Number of Spiders	
	1997	1998	1997	1998	1997	1998
January	12.3	13.0	66.0	64	17	15
February	11.0	14.3	62.9	64	24	25
March	13.4	14.7	62.0	59	44	36
April	16.6	21.5	61.0	57	47	42
May	23.3	24.9	54.0	56	51	48
June	26.8	27.3	59.0	56	58	52
July	26.9	28.0	62.0	59	60	64
August	25.6	29.8	65.0	51	65	64
September	24.7	29.8	62.0	51	59	61
October	23.3	25.2	62.0	57	22	25
November	19.4	20.9	63.0	60	24	30
December	14.2	18.9	65.0	59	15	18

Correlation coefficient between total number of spiders and temperature mean.

High significant correlation in both 1997 (P = 0.0022) and 1998 (P = 0.0022).

Correlation coefficient between total number of spiders and R.H. mean.

High significant correlation in both 1997 (P = 0.0054) and 1998 (P = 0.0054).

Statistically analyzed data indicated that, a significant positive correlation existed between the population density of spiders and temperature, but the relative humidity did not show any significant effect in the two years (Table 4).

3. El-Qalyubia governorate

Results in Table (5) clearly indicated that the population density of spiders gradually increased from January to May in the two successive years. The total numbers were 17-51 individuals (mean = 36.6) at average temperature 11-23.3 °C and relative humidity 54-66 % R.H. in 1997. In the second year these numbers were 15-48 individuals (mean = 33.2) at average temperature 13-24.9 °C and relative humidity 56-64 % R.H.

The population density reached its maximum in July, August and September with total numbers 59-65 individuals in 1997 and 61-64 individuals in 1998, at average temperature 24.7-26.9 and 28-29.8 °C and relative humidity 62-65 and 51 % R.H. in the two successive years, respectively.

Statistical analysis showed that, high significant positive correlation existed between the population density of spiders and both temperature and relative humidity during the two successive years (Table 5).

Table 6: Seasonal abundance of spiders on apple trees at El-Sharqia governorate in 1997 and 1998.

Month	Temp. Mean °C		R.H. Mean %		Total Number of Spiders	
	1997	1998	1997	1998	1997	1998
January	14.9	13.4	62.0	68	19	10
February	13.9	13.4	55.9	68	23	15
March	15.7	17.5	58.0	58	28	23
April	18.9	20.8	62.5	52	30	33
May	25.4	26.5	57.0	55	34	20
June	28.2	29.0	61.0	55	39	30
July	28.3	30.4	62.0	59	37	18
August	26.9	31.9	65.0	59	39	37
September	26.9	30.0	64.0	55	51	45
October	22.1	27.6	63.0	54	59	50
November	18.4	22.9	42.0	59	65	50
December	14.3	18.9	67.2	59	34	32

Correlation coefficient between total number of spiders and temperature mean.

Insignificant correlation in both 1997 (P = 0.40) and 1998 (P = 0. 2027).

Correlation coefficient between total number of spiders and R.H. mean.

Insignificant correlation in both 1997 (P = 0.1247) and 1998 (P = 0. 088).

4. El-Sharqia governorate

Results in Table (6) clearly indicated that the population density of spiders was low during January and February then gradually increased reaching a maximum

during autumn (September - November) in the two successive years. The total numbers were 51-65 and 45-50 individuals, at average temperature 18.4-26.9 and 22.9-30 °C and relative humidity 42-64 and 54-59 % R.H. in the two successive years, respectively.

However, results obtained did not show any significant correlation between the population density of the spiders and both temperature and relative humidity in the two years (Table 6).

In conclusion, the above mentioned results clearly demonstrated that the high population density of the spiders occurred from mid summer till mid autumn (August to October) in the four governorates. These results agreed with those obtained by Hussein (1999) and Mohafez (2000).

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